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# China Report

SCIENCE AND TECHNOLOGY

No. 54



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# CHINA REPORT SCIENCE AND TECHNOLOGY

No. 54

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## NATIONAL DEVELOPMENTS

### STUDY OF EXTRASENSORY PHENOMENA CONTINUES

OW180741 Beijing XINHUA in English 0706 GMT 18 Jul 80

[Text] Beijing, July 18 (XINHUA)--A noted Chinese scientist has joined public discussions on people who appear to be able to read words and distinguish colours and objects without seeing them.

Some of the people are able to read written material placed beside their ears, under their feet, or under their armpits.

The scientist, Qian Xuesen, told XINHUA: "Research into such special sensing functions will deepen man's understanding of himself and promote the development of life science."

Though this phenomenon cannot yet be explained scientifically, he said, objective facts have to be respected and steps taken to study it.

News of the super-sensory people surfaced in March last year when a 12-year-old student, Tang Yu, of Sichuan Province, Southwest China, was able to read words on a paper behind his ears. Since then dozens of people, children and adults with such special sensing ability, have been discovered in Beijing, Shanghai, Henan, Hebei, Heilongjiang and other localities.

Wang Bin and Wang Qiang of Beijing are sisters who can distinguish an object hidden on another person one metre away.

A 25-year-old woman in Heilongjiang, Northeast China, can read the characters on five cards placed on different parts of her body.

Chinese historians have found similar reports in ancient Chinese classics, including "Liezi" (a philosophy book in the warring states period 475--221 B.C.) and "Historical Records" published more than 2,000 years ago.

Scientists and research workers are investigating the phenomenon. Some hold that study of this will open new frontiers for biology, physiology, medicine, physics and biophysics. However, others disagree and call it "unscientific nonsense."

CSO: 4020

## NATIONAL DEVELOPMENT

### BRIEFS

WATER ACOUSTICS EXPERT--Beijing, 9 Aug (XINHUA)--Shang Erchang, who was recently appointed as the deputy director of the Acoustics Institute of the Chinese Academy of Sciences, has scored outstanding scientific achievements concerning the theory of sound propagation in shallow water and won international recognition for his scholastic attainment. At the 10th international acoustics conference recently held in Sydney, Australia, he delivered two theses, one on a new method for receiving sound signals in shallow waters and the other on the boundary effect of noise in shallow waters. The new viewpoints he expounded in the theses were acclaimed by the conference participants. In collaboration with noted Chinese acoustics expert Wang Dezhaoh, Shang Erchang recently completed the 300,000 word manuscript of "Water Acoustics." [Beijing XINHUA Domestic Service in Chinese 0714 GMT 9 Aug 80 OW]

BEIJING MATHEMATICS SYMPOSIUM--Beijing, 19 Aug (XINHUA)--A 5-week symposium on differential geometry and partial differential equations opened here yesterday at the Science Hall of the Friendship Hotel. Mathematicians from Britain, Canada, France, Italy, Japan, Sweden, West Germany, the United States and Hong Kong are participating on invitation. The symposium was organized jointly by the Chinese Academy of Sciences, Beijing University and Pudan University. Chinese mathematician Wu Wenjun, director of the Institute of Systems Science, was chairman of the symposium's organizing committee. Professor S. S. Chern, member of the National Academy of Sciences of the United States, was head of the U.S. delegation. Yan Jici, vice-president of the Chinese Academy of Sciences, presided over the opening session. [OW211101 Beijing XINHUA in English 1220 GMT 19 Aug 80]

CSO: 4020

MATHEMATICAL MODELS USED IN AVIATION MEDICINE

Beijing HANGKONG ZHISHI [Aeronautical Knowledge] in Chinese No 11, Nov 79  
pp 35-36

[Article by Xie Zhaoyun [6200 0340 0061]: "Mathematical Models and the Human Body"]

[Text] When a newly designed airplane's handling performance may or may not be good, and when the airplane produces various dynamic factors while in flight that the pilot may or may not be able to tolerate, what protective measures can improve the pilot's endurance? These are all important questions that must be given attention when designing an aircraft. These problems must be solved through a study of the characteristics of pilots conducted with coordination between aviation medicine units and design and manufacturing units. By the end of World War II, the speed of aircraft already exceeded 600 kilometers per hour. If an aircraft had a mishap during air combat at that time, the pilot had no way of climbing out of the cockpit. A German engineer of that time proposed placing the pilot in a specially constructed kind of gun barrel and use the force of a shell to propel the pilot out of the cockpit and away from danger. But could a pilot tolerate such large ejection forces? Medical scientists carefully studied the structure of the human body's spinal column and conducted some experiments on the human body to demonstrate that this was workable. Thus was born the ejectable cockpit seat. The product of this combination of engineering and medicine has continued to be used right up to the present time.

As the speed of aircraft has increased, pilots have been subjected to stronger dynamic forces. For example, in some stunt flying, the speed may reduce the pilot's ability to act or make him black out. The shock generated by low-level flight may make it difficult for the pilot to control the aircraft. In super-sonic flight, when the pilot ejects himself from an aircraft, the force of the high speed air currents may cause injury to his head or limbs. Additionally, since the cockpit seat is not stable when the pilot goes through air currents, rapid revolving may occur. When his parachute opens, great pounding forces may be generated, and great strike forces may develop at the moment of impact with the ground. These are all dynamic factors. How these dynamic factors are dealt with



at the time an aircraft is designed has great ramifications, and if they are not completely thought through, pilot injury or even death may result. But how can pilot endurance be determined in various dynamic environments? This is really a difficult problem. During the early 1950's, various ground simulating equipment was studied, as for example, high speed centrifuges, large ejection towers, vibration tables, and rocket slides to simulate various dynamic factors in the conduct of both animal and human experiments. But such experiments carried definite risks for the human body, so the number of experiments were limited and unable to satisfy design requirements. Consequently, toward the end of the 1950's as computer technology developed, some people abroad explored use of mathematical methods to study the reaction of biological organisms to various dynamic factors. These methods of study were called simulation techniques for short, and the models used were called biological dynamic models.

Though the structure of biological organisms has its own special characteristics, it is also similar in many ways to that of a machine. For example, biological organisms will also undergo changes under outside forces, and when their structural strength is exceeded, a splitting and breaking of tissue occurs. For example, if in the course of ejection, the ejection force exceeds the limits of tolerance of the human body, a compressional breaking of the backbone will take place. This is identical to the laws that change the shape of a spring's damping system when force is applied to it, and so a spring's damping system may be used to simulate the ligaments, the muscles, and the intervertebral discs of the human body. (Figure 3). By checking its reaction, we can indirectly understand the laws governing reaction of the human body. Various mathematical formulas (i.e. mathematical models) may be used to express the laws of movement of these mechanical systems when subjected to outside forces. By calculating the applied force and the parameters of the mechanical system, the reaction of the simulator equipment may be derived, and one can learn how great an amount of applied force is required before damage to the human body would result. Though use of the data derived from the models may sometimes require experiments with real people or with animals for verification purposes, or further verification from data received when people are injured in flying accidents, still only a small number of experiments are required to obtain full data. This is safe and causes no injury to people. Dynamic models used in foreign countries for the study of the extent of endurance of the human vertebrae when ejected upward have been successful, and through the use of dynamic response indicators (called DRI for short), the extent of damage to the backbone from the ejection seat may be predicted. The dynamic response indicator refers to the acceleration actually exerted inside the human body (not the action acceleration) as a certain number of times that of the acceleration of gravity. This acceleration forms a linear functional relationship with the rate of injury to the vertebrae. For example, a DRI of 18.0 indicates the rate of injury to the vertebrae is under 50 percent, and a DRI of 20.4 means the rate of injury may amount to 20 percent. A DRI of 23.0 means the injury rate is in excess of 50 percent. These data are identical with the actual situation. In 1976, the United States Air



Force placed the DRI in the standards for ejection seats used by the air force, stipulating that the vertebrae injury rate had to be under 50 percent, i.e. the DRI could not exceed 18.0. The results of this research are considered to have made a great contribution to the design and appraisal of ejection seats.

During the last 10 years, thanks to the application of "limited units" in electronic computer calculations, great advances have been made in the development of models for biological dynamics. The so-called "limited units" entails dividing the structurally complex human body into various units that are simple in form (and which are called elements. See Figure 4). The characteristic motions of these elements are represented by mathematical forms, and arranged in various equations to solve initially for numerical value of reaction for each unit and ultimately to obtain the numerical values for the reactions of the entire human body.

Biological dynamic model technique has shown itself to be advantageous as a result of experience in the following ways:

1. There is no need to use or little need to use people or valuable animals (such as monkeys) to perform dangerous endurance experiments. Models may be used instead;
2. Speed of calculations is rapid; precision is high; and a lot of manpower, time and expense may be saved;
3. Human endurance of the dynamic environment and the required parameters for aircraft design can be postulated;
4. Overall reactions between man and machine systems may be determined, and comparative appraisals may be made of various aircraft design plans, which is helpful in improving the product performance.

Because biological dynamics models possess these advantages, their development has been exceptionally swift during the past 10 years, and they have already become an important component part of biological and medical research. Now it is possible not only to simulate the reaction to the affects of external forces of the head, the backbone, the chest and the four limbs, but also possible to simulate the reaction to the affects of external forces of the cardio-vascular system and even of soft tissues. Initially the models were limited to single degree of freedom movements, but now there are three degrees of freedom. Electronic computers can simulate not only the direction and size of action forces, but can also display in a three dimensional view the positional and quantitative data of the changed shape following application of force, and they can graphically display on a screen the observed affects of the active forces (Figure 5).

Though application to aviation medicine of model techniques have been in the beginning stage in recent years, notable results have already been

obtained. Still the structure of the human body is much more complicated than that of a machine system. Currently under study are simply problems related to structural strength and simple performance of the human body. For more complex systems such as the functioning of the cardiovascular system and the pulmonary system, numerous problems still exist in setting up mathematical models and control sequencing that require further solution.

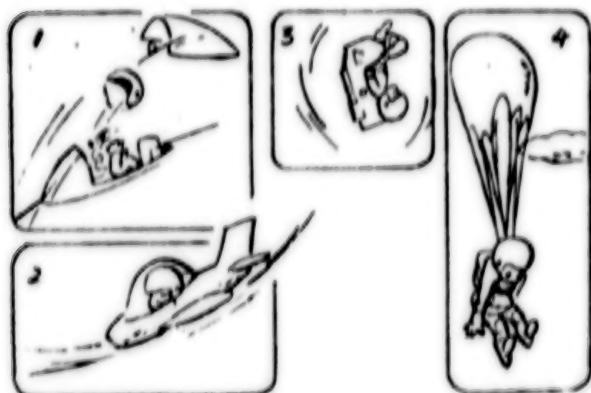


Figure 1. Dynamic elements in flight

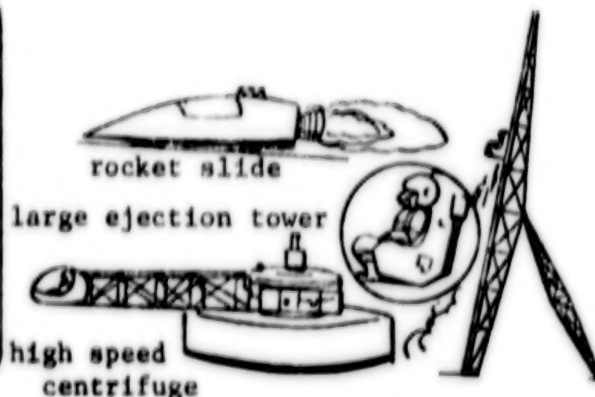


Figure 2. Ground simulators

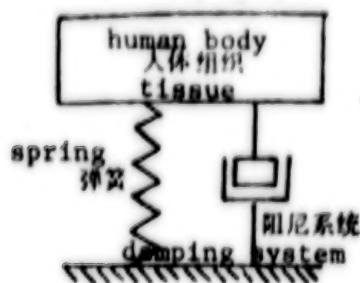


Figure 3. Human backbone simulation

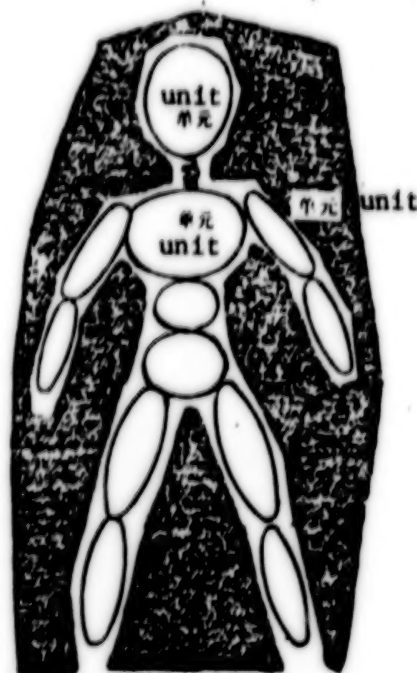


Figure 4. Limited unit method sketch



Figure 5. Display showing changes in human vertebrae

## SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

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Tape 1 FEI-CH'ING YUEH-PAO in Chinese Vol 22, No 11, 15 May 80 pp 59-62,  
Information as of 20 March 1980

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33. China Pedology Society

[Zhongguo Turang Xuehui 0022 0948 0960 1099 1331 2585]

Chairman: Li Qingkui [2621 1987 6652]

Secretary General: Huang Ruicai [7806 3843 6846]

34. China Scientific and Technological Information Society

[Zhongguo Keji Qingbao Xuehui 0022 0948 4430 2111 1906 1032 1331 2585]

Chairman: Wu Heng [2976 5899]

Vice Chairmen: Nie Chunrong [5119 2504 2837]  
Yuan Hanqing [5913 5060 7236]  
Shi Zejun [2457 3419 6874]

Secretary General: Hu Anxiang [5170 1344 4382]

35. China Medical Society

[Zhongguo Yixuehui 0022 0948 6829 1331 2585]

Chairman: Qian Xinzong [6929 0207 1813]

Vice Chairmen: Chen Zhengming [7115 2398 2494]  
Lu Zhijun [7627 0037 0193]  
Song Zhonggeng [1345 4545 6342]  
Wu Yuanshou [0702 7086 2087]  
Cui Yitian [1508 5030 3944]  
Fang Shishan [2455 4258 3790]  
Zhong Huilan [6945 1920 3482]  
Hu Zhuankui [5170 0278 2247]  
Qin Bozhu [4440 0130 2612]  
Yao Kefang [1202 0344 2455]  
Gong Naiquan [1362 0035 3123]  
Yan Puqing [7346 4395 1987]  
Shen Kefei [3088 0344 7236]  
Lin Qiaoshi [2651 1564 4460]  
Huang Dingchen [7806 7844 5256]  
Huang Jiasi [7806 1367 7475]  
Qu Zhong [2575 2973]

Secretary General: Chen Zhengming [7115 2398 2494] (concurrently)

36. China Pharmacology Society

[Zhongguo Yaoxue Xuehui 0022 0948 5673 1331 1331 2585]

Chairman: Long Zaishen [7893 0961 7201]

Vice Chairmen: Li Wenshen [2621 4850 4394]  
Meng Mudi [1322 4158 4104]  
Zeng Guangfang [2585 1684 2455]  
Li Xinglong [2621 5281 7127]  
Huang Jiasi [7806 1367 7475]  
Wang Xu [3769 1645]

Secretary General: Meng Mudi [1322 4158 4104]

37. China Corrosion and Corrosion Prevention Society

[Zhongguo Fushi Yu Panghu Xuehui 0022 0948 5201 5793 5280 7089 6233  
1331 2585]

Chairman: Qin Lisheng [4440 0500 3932]

Vice Chairmen: Zhang Wenji [1728 2429 1142]  
 Shen Zongxiang [3088 1073 4382]  
 Xian Shujin [5029 2579 6930]  
 Shi Shengtai [4298 5116 3141]

38. China Forestry Society

[Zhongguo Linxuehui 0022 0948 2651 1331 2585]

Chairman: Chen Hong [7115 1532]

Vice Chairmen: Lao Tianyu [2867 1131 1342]  
 Zheng Wanjuan [6774 5502 6874]  
 Zhu Jifan [2612 3444 0416]  
 Zhu Hui Fang [2612 1920 2455]

Secretary General: Wu Zhonglun [0702 0022 0245]

39. China Entomology Society

[Zhongguo Kunchong Xuehui 0022 0948 2492 5849 1331 2585]

Chairman: Chen Shixiang [7115 0013 7534]

Secretary General: Zhu Hongfu [2612 1738 1788]

40. China Aquatic Products Society

[Zhongguo Shailiehan Xuehui 0022 0948 3055 3934 1331 2585]

Chairman: Yang Puqing [2799 2105 7230]

Vice Chairmen: Zhu Zhiding [2612 0037 7844]  
 Wu Xianwen [0124 3759 2429]  
 Zhu Shaping [2612 2885 1456]

Secretary General: Gong Mingshan [1362 2494 1472]

41. China Coal Mining Society

[Zhongguo Meitan Xuehui 0022 0948 3561 3516 1331 2585]

Chairman: Jin Bingzhang [6328 3521 4545]

Secretary General: He Jie [0149 2638]

42. China Microbiology Society

[Zhongguo Weishengwu Xuehui 0022 0948 1792 3932 3670 1331 2585]

Chairman: Yu He [0151 3055+6320]

Vice Chairmen: Pang Xinfang [2455 1800 5364]  
 Gao Shangyin [7559 1424 5593]  
 Wei Xi [7614 2569]



Secretary General: Xiang Wangwu [4161 2598 3541]

43. China Anatomy Society

[Zhongguo Jiepu Xuehui 0022 0948 6043 0472 1331 2585]

Chairman: Zhang Yun [1728 9462]

Vice Chairman: Wu Rukang [0702 3067 1660]

Secretary General: Xue Shepu [5641 4357 2528]

44. China Marine Navigation Society

[Zhongguo Hanghai Xuehui 0022 0948 5300 3189 1331 2585]

Chairman: Luo Yuru [5012 6877 1172]

Vice Chairman: Deng Zhaoxiang [6772 0340 4382]

45. China Refrigeration Engineering Society

[Zhongguo Zhileng Gongcheng Xuehui 0022 0948 5956 0397 1562 4453 1331 2585]

Vice Chairman: Cao Naikang [2580 0035 1660]

46. China Physiology Society

[Zhongguo Shengli Kexuehui 0022 0948 3932 3810 4430 1331 2585]

Chairman: Cai Qiao [5591 5062]

Vice Chairmen: Zhao Yibing [6392 0110 3521]

Zhou Jinhuan [0719 6855 7806]

Liu Yong [0491 3057]

Xue Gonghuo [5641 0361 4862]

Secretary General: Li Shangwu [2621 1424 2976]

47. China Nurses Society

[Zhonghua Huli Xuehui 0022 0948 6233 3810 1331 2585]

Chairman: Chen Kunti [7115 0981 1912]

Vice Chairmen: Zhu Bihui [2612 4310 6540]

Wang Yi [3769 2034]

Wang Xiuying [3769 3811 3841]

Zhai Zhenliu [5049 2650 3177]

Wang Meizhen [3769 5019 4176]

Chen Qi [7115 3823]

Mei Zuyi [2734 4371 2034]

Chen Suwen [7115 4790 2429]

Wang Xiaojian [3769 2400 4148]

Secretary General: Ma Shuliang [7456 3219 0081]

48. China Anti-Tuberculosis Society

[Zhongguo Fanglao Xuehui 0022 0948 7089 4072 1331 2585]

Chairman: Huang Dingchen [7806 7844 5256]

Vice Chairman: Wu Shaoqing [0702 4801 7230]

Secretary General: He Mu [0149 4476] (acting)

49. China Agricultural Crops Society

[Zhongguo Nongzuowu Xuehui 0022 0948 6593 0155 3670 1331 2585]

Chairman: Jin Baoshan [6855 1405 0810]

Vice Chairmen: Hu Jingliang [5170 4544 5328]

Dai Songen [2071 2646 1869]

Cai Xu [5591 2485]

He Kang [0149 1660]

Secretary General: Dai Songen [2071 2646 1869]

50. China Animal Husbandry and Veterinary Society

[Zhongguo Xumu Shouyi Xuehui 0022 0948 3964 3668 3757 6829 1331 2585]

Chairman: Cheng Shaohui [4453 4801 0932]

Vice Chairmen: Luo Qingsheng [5012 3237 3932]

Xiong Dashi [3574 1129 0099]

Zhang Shengsan [1728 4164 0005]

Secretary General: Ma Wentian [7456 5113 1131]

51. China Horticultural Society

[Zhongguo Yuanyu Xuehui 0022 0948 0954 5669 1131 2585]

Chairman: Wang Gengsheng [3769 2577 3932]

Vice Chairmen: Yu Tingzi [0060 3060 1311]

Zhang Ziming [1728 1311 2494]

Yu Dejun [0205 1795 3182]

Shen Jun [3088 7165]

Secretary General: Zhang Ziming [1728 1311 2494]

52. China Plant Protection Society

[Zhongguo Zhiwu Baohu Xuehui 0022 0948 2784 3670 0202 6233 1331 2585]

Chairman: Yu Dafu [0205 1129 4811]

Vice Chairmen: Cai Banghua [5591 6721 5473]  
Shen Qiyi [3088 0366 4135]  
Zhu Fengmei [2612 7364 5019]  
Zhao Shanjuan [6392 0810 2970]

53. China Sericulture Society  
[Zhongguo Canxuehui 0022 0948 5874 1331 2585]

Chairman: Sun Gengsheng [1327 2577 3932]

Vice Chairmen: Yuan Qinghong [7349 7230 5725]  
Yang Bangjie [2799 6721 2638]  
Chen Zhiyuan [7115 4999 0997]  
Xiong Jiguang [3574 1323 0342]

Secretary General: Gao Yiling [7559 0001 7117]

54. China Tea Society  
[Zhongguo Chaye Xuehui 0022 0948 5420 5509 1331 2585]

Chairmen: Wu Juenong [0702 6030 6593] (Honorary)  
Wang Zenong [3769 3419 6593]

Secretary General: Liu Jiakun [0491 1367 0981]

55. China Tropical Agricultural Crops Society  
[Zhongguo Redai Nongzuowu Xuehui 0022 0948 3583 1601 6593 0155 3670  
1331 2585]

Chairman: Liang Wenchu [2733 2429 1062]

56. China Mineralogical, Petrological and Geochemical Society  
[Zhongguo Gongwu Yeshi Diqu Huanxue Xuehui 0022 0948 4349 3670 1484  
4258 0966 3808 0553 1331 1331 2585]

57. China Agricultural Economy Society  
[Zhongguo Nongye Jingji Xuehui 0022 0948 6593 5509 4842 3444 1331 2585]

Chairman: Cai Ziwei [5591 1311 0251]

58. China Genetics Society  
[Zhongguo Yichuan Xuehui 0022 0948 6695 0278 1331 2585]

Chairman: Li Quqi [2621 3067 4388]

Vice Chairmen: Tan Jiazheng [6151 1367 2823]  
Zu Deming [4371 1795 2494]  
Jin Guangxu [6855 0342 4371]  
Zhong Zhixiong [6945 1807 7160]  
Hu Han [5170 0698]

China Genetics Society (cont'd)

Vice Chairmen: Lu Huilin [4151 1920 7207]  
Shen Shanjiang [3088 0810 8741]  
Xi Kangling [1153 0073 0109]  
Fang Zongxi [2455 1350 3356]

Secretary General: Wu Haoling [0702 7729 0109]  
Wu Wen [0702 7186]  
Li Zhengxun [2621 2398 8113]

59. China Solar Energy Society (Established 14 April 1979)  
[Zhongguo Taiyangneng Xuehui 0022 0948 1132 7122 5174 1331 2585]

Chairman: Wang Puxuan [3769 2883 1357]

Vice Chairmen: Gong Bao [7895 1027]  
Liao Shaobao [1675 1421 5508]  
Wei Yanzhang [7614 1750 4545]

60. China Nuclear Society (Established 28 February 1980)  
[Zhongguo Hexuehui 0022 0948 2702 1331 2585]

Chairmen: Qian Sanqiang [6929 0005 1730] (Honorary)  
Wang Ganchang [3769 3227 2490]

Vice Chairmen: Zhu Guangya [2612 0342 0068]  
Zhang Zhenhuan [3769 7201 1403]  
Zhang Wenyu [1728 2429 5940]  
Zhao Zhongyao [6392 1813 1031]  
Jin Baochi [6855 1405 4609]  
Li Jue [2621 6030]  
Jiang Shengjie [1203 5110 7132]

61. China Gravitation, Relativity and Astrophysics Society (Established  
8 December 1979 in Suzhou)  
[Zhongguo Yinli Yu Xiangduilun Tianti Wuli Xuehui 0022 0948 1714 0500  
5280 4161 1417 6158 1131 7555 3670 3810 1331 2585]

Chairman: Hu Ning [5170 1380]

Vice Chairmen: Pang Lizhi [2455 0536 0037]  
Chen Jiayan [7115 0837 6056]  
Guo Hanying [6753 3352 5391]  
Qin Rongguang [4440 2837 0342]

62. China Vacuum Society (Established December 1979 in Lanzhou)  
[Zhongguo Zhenkong Xuehui 0022 0948 4176 4500 1331 2585]

63. China Field Statistics Society (Founded December 1979 in Beijing)  
 [Zhongguo Xianchang Tongji Yanjiu Hui 0022 0948 3807 1034 4827 6060  
 4282 4496 2585]
64. China Science and Technology Popularization and Creation Society  
 [Zhongguo Kexue Jishu Puji Chuangzuo Xiehui 0022 0948 4430 1331 2111  
 5890 2528 0644 0482 0155 0588 2585]
- Chairman: Mao Yisheng [5403 0110 0581] (Honorary)
- Vice Chairman: Wen Jize [3306 3444 3419]
65. China Microwave Spectroscopy, Atomic and Molecular Physics Society  
 [Zhongguo Bopuxue He Yuanzi Fenzi Wulixue Xuehui 0022 0948 3134 6225  
 1331 0735 0626 1311 0433 1311 3670 3810 1331 1331 2585]
66. China National Traditional Chinese Medicine Society (Founded 24 May 1979)  
 [Zhonghua Quanguo Zhongyi Xuehui 0022 5478 0356 0948 0022 6829  
 1331 2585]
- Chairman: Cui Yueli [1508 2588 3680]
- Vice Chairmen: Zou Yunxiang [6760 0060 5046]  
 Zhao Bingman [6392 3521 0589]  
 Tao Fu [7118 3940]  
 Lu Zhijun [7627 0037 1093] and 11 others
67. China Acupuncture and Moxibustion Society (Founded 25 May 1979)  
 [Zhongguo Zhenjiu Xuehui 0022 5478 6859 3502 1331 2585]
- Chairman: Lu Zhijun [7627 0037 0193]
68. China Seismology Society (Founded 22 December 1979 in Dalian)  
 [Zhongguo Dizhen Xuehui 0022 0948 0966 7201 1331 2585]
- Chairman: Gu Gongxu [7357 0501 0650]
69. China Space Flight Society (Founded 1979)  
 [Zhongguo Yuhang Xuehui 0022 0948 1342 5300 1331 2585]
70. China Quality Control Society (Founded 5 September 1979 in Beijing)  
 [Zhongguo Zhiliang Guanli Xiehui 0022 0948 6347 6852 4619 3810 0588  
 2585]
- Chairman: Yue Zhijian [7471 1807 1017]
- Vice Chairmen: Cao Jilian [2580 4944 1670]  
 Hao Jianxiu [6787 1696 4423]  
 Song Ligang [1345 0500 0474]

China Quality Control Society (cont'd)

Vice Chairmen: Yang Jizhi /2799 3444 0037/  
Liu Yuanzhang /0491 3293 1728/  
Zhou Zhanna /0719 0594 7663/

71. China Forest Products and Chemical Industry Society (Founded 14 November 1979 in Nanjing) /Zhongguo Linchan Huagong Xuehui 0022 0948 2651 3934 0553 1562 1331 2585/

72. China Archeology Society (Founded 22 April 1979 in Xi'an)  
/Zhongguo Kaogu Xuehui 0022 0948 5072 0657 1331 2585/

Chairman: Xia Nai /1115 7845/

Vice Chairmen: Pei Wenzhong /5952 2429 0022/  
Yin Da /1438 6671/  
Su Bingqi /5685 4426 3823/

Secretary General: Wang Zhongshu /3769 0112 2992/

73. China Atomic Energy and Agriculture Society (Founded 14 April 1979 in Hangzhou) /Zhongguo Yuanzhiheng Nongxuehui 0022 0948 0626 1311 5174 6593 1331 2585/

Chairman: Xu Guanren /1776 0385 0088/

74. China Paleomicrobiology Society (Founded 10 April 1979 in Changsha)  
/Zhongguo Weiti Gushengwu Xuehui 0022 0948 1792 7555 0657 3932 3670 1331 2585/

75. China Education Society (Founded 26 April 1979 in Beijing)  
/Zhongguo Jiaoyu Xuehui 0022 0948 2403 5148 1331 2585/

Chairmen: Chen Haoqin /1115 7729 3830/ (Honorary)  
Yang Xiufeng /2799 4423 1496/ (Honorary)  
Cheng Fangwu /2052 0119 0710/ (Honorary)

Vice Chairman: Zhang Jian /1728 1695/

76. China Pedagogical Society  
/Zhongguo Jiaoxuexue Yanjiuhui 0022 0948 2403 1331 1331 4282 4496 2585/

Chairman: Dai Botao /2071 0130 7290/

Vice Chairman: Chen Yuanhui /1115 0337 6540/

77. China Gun Society (Founded 15 April 1979 in Xi'an)  
/Zhongguo Huopao Xuehui 0022 0948 3499 4276 1331 2585/



78. China Cotton Society  
 [Zhongguo Mianhua Xuehui 0022 0948 2758 5363 1331 2585]  
 Chairmen: Yang Xiandong [2799 7359 2639] (Honorary)  
 Wu Yuanling [0702 0337 7881]  
 Vice Chairmen: Zang Chengyao [5258 2052 5069]  
 Wang Guiwu [3769 2710 0063]  
 Qin Jie [4440 2638]
79. China Biochemistry Society (Founded May 1979 in Hangzhou)  
 [Zhongguo Shengwu Huaxue Xuehui 0022 0948 3932 3670 0553 1331 1331 2585]  
 Chairman: Wang Yinglai [3769 2019 4202]  
 Vice Chairmen: Cao Tiangin [2580 1131 2953]  
 Zou Chenglu [6760 2110 7627]  
 Zhang Longxiang [1728 7893 5046]  
 Liang Zhiquan [2733 2784 2938]
80. China Ordnance Society  
 [Zhongguo Binggong Xuehui 0022 0948 0365 1562 1331 2585]
81. China Optics Society (Founded March 1979 in Beijing)  
 [Zhongguo Guangxue Xuehui 0022 0948 0342 1331 1331 2585]
82. China Environmental Sciences Society (Founded 30 March 1979 in Chengdu)  
 [Zhongguo Huanjing Kexue Xuehui 0022 0948 3883 1064 4430 1331 1331 2585]  
 Chairman: Li Chaobo [2621 6389 0130]  
 Vice Chairmen: Li Su [2621 5685]  
 Qian Xinzhong [6929 0207 1813]  
 Ma Dayou [7456 1129 3731]  
 Zeng Chengkui [2582 0701 1145]  
 Qu Zhongxiang [2575 0112 3276]  
 Guo Zuyuan [6665 4371 3293]  
 Liu Dongsheng [0491 2639 3932]  
 Chen Xiping [7115 6007 1627]  
 Secretary General: Chen Xiping [7115 6007 1627] (concurrently)
83. China Engineering Thermophysics Society (Founded 1979)  
 [Zhongguo Gongcheng Rewuli Xuehui 0022 0948 1562 4453 3583 3670 3810 1331 2585]

84. China Cytology Society (Founded 1979)  
[Zhongguo Xibao Shengwu Xuehui 0022 0948 4790 5165 5952 5670 1331 2505]
85. China Ecology Society (Founded 1979)  
[Zhongguo Shengtai Xuehui 0022 0948 5952 1966 1331 2505]
86. China Standardisation Society (Founded 1979)  
[Zhongguo Biaoqunhui Xuehui 0022 0948 2871 3294 0553 1331 2505]
87. China Instruments and Meters Society  
[Zhongguo Yiqi Yibiao Xuehui 0022 0948 0308 0892 0308 9473 1331 2505]  
Chairman: Wang Dehao [3076 1795 2505]
88. China Acoustics Society  
[Zhongguo Shengxue Xuehui 0022 0948 5116 1331 1331 2505]  
Chairman: Wang Dehao [3076 1795 2505]
89. China Technical Economics Society  
[Zhongguo Jishu Jingji Yanjiuhui 0022 0948 2111 5890 4842 3444 4282 4496 2505]
90. China Modernized Management Society  
[Zhongguo Xindaihua Guanli Yanjiuhui 0022 0948 3807 0108 0553 4619 3810 4282 4496 2505]
91. China Abacus Society  
[Zhongguo Zhaizuan Xuehui 0022 0948 3796 4615 0588 2505]  
Chairman: Yin Changsheng [3009 7022 3932]
92. China Light Industry Society  
[Zhongguo Qinggongye Xuehui 0022 0948 6535 1562 2814 1331 2505]  
Vice Chairman: Ge Chunlin [5514 2504 7207]
93. China Apilary Society  
[Zhongguo Yangfeng Xuehui 0022 0948 7402 5762 1331 2505]  
Chairman: Xu Ren [1776 0085]
94. China Palynology Society  
[Zhongguo Paofen Xuehui 0022 0948 5916 4720 1331 2505]  
Chairman: Ma Defeng [7456 1795 7364]
95. China Sedimentation and Organic Geochemistry Society  
[Zhongguo Chenjixue He Youji Diqu Huanxue Xuehui 0022 0948 3089 4480 1331 0735 2589 2894 0966 3808 0553 1331 1331 2505]

## SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

### 'RENMIN RIBAO' COMMENTATOR DISCUSSES ARCHIVES WORK

HK111420 Beijing RENMIN RIBAO in Chinese 29 Jul 80 p 3

[Article by commentator: "Vigorous Resume and Systematize Scientific and Technical Archives Work"]

[Text] In the process of strengthening the economic, technical and scientific management of enterprises and institutions, there is one task which some comrades have frequently neglected. This task is indispensable to our productive construction and scientific research. Without it, we are unable to carry out our productive construction and scientific research, or we will suffer enormous economic losses. It is the task of collecting, systematizing and utilizing the scientific and technological archives, which is also called scientific and technological archives work for short.

Recently, the State Economic Commission, the State Capital Construction Commission, the Scientific and Technological Commission and the State Archives Bureau held a joint work conference, conscientiously studying and discussing the way to accelerate the restoration and systematization of scientific and technological work and bring the role of such work into full play in the four modernizations. The conference put forward many good opinions and proposed specific measures which merit the attention of various departments, areas and units.

While carrying out production, construction, scientific research and geological exploration and so forth, various factories, mines, capital construction units, designing institutes, scientific research units and geological exploration teams produce a large number of technical documents such as blueprints, charts, statistical tables, reports, data, photos and so on. The work of collecting, systematizing and preserving these technical documents in accordance with certain archival systems for further use generates scientific and technological archives. All of these records make up scientific and technological archives which reflect the fruit of work and crystallization of wisdom and are the basis and necessary conditions which will insure further productive construction, scientific and research activities as well as maintenance and management

of capital construction. There is no doubt that all these scientific and technological archives should be properly preserved and managed in a centralized way. It is common sense to do so. Why should such a task be a problem and need restoring and systematizing? There are a variety of reasons contributing to such a defect. It was mainly caused by the 10 years of disaster brought about by Lin Biao and the "gang of four," which greatly harmed scientific and technological archives work. A great number of scientific and technological archives were lost and destroyed. Influenced by ultraleftist guiding thought contrary to science such as "simultaneous designing, building and going into operation," we discarded even the blueprints after some modern projects concerned had been completed. Such an act entailed serious consequences. In the meantime, due to the fact that scientific and technological archives work is a new undertaking, some of our comrades have failed to realize its significance. Many comrades have consciously or unconsciously judged modern and large-scale production as well as technical and scientific research from a viewpoint of petty producers. They have failed to realize that after the completion of certain projects, some necessary original records should be filed. As a result, more than 3 years after the smashing of the "gang of four," there are still quite a number of industry and communications enterprises, capital construction departments and scientific research units which have not established a necessary system of scientific and technological archives work. This has caused us enormous losses politically and economically. Therefore, it is absolutely necessary to restore and systematize our scientific and technological archives work.

Scientific and technological archives are a form of expression and existence of scientific and technological thought, as well as scientific and technological resources of the development of productive forces. According to statistics issued by some units, under normal conditions, while studying designing and producing new products on a trial basis, scientific and technical personnel have to spend more than 30 percent of their time on looking up and consulting documents and data. Various enterprises and institutions need scientific and technological archives in their direct productive and scientific research activities. Apart from that, scientific and technological archives are also indispensable to them in order to exercise administrative control over production, plans, technology and product quality. We often say that we should avoid doing things and making assertions without a good foundation. Scientific and technological archives are important bases for doing things and making assertions. Since the founding of new China, we have suffered a lot because of the neglect of scientific foundations. The phenomenon of "losing scientific contention and wasting enormous funds because of the failure to keep archives" must not and should not be allowed to occur any more.

Taking scientific and technological archives work as a component part of modern production, construction and scientific research activities and consciously including it in the scientific and technological management

work of various enterprises and institutions is the key to doing a good job in restoring and systematizing the present scientific and technological archives work. This is also a basis for further developing and improving various scientific and technological management work in the future. The basic principle of scientific and technological archives work is unified management. It is, of course, an inescapable duty of archives departments to stick to such a principle. To do our work well, it is insufficient to rely on archives departments only. We should fully arouse the enthusiasm of all scientific personnel, engineers and technicians in various national economic departments as well as scientific and technological institutes. Therefore, restoration and systematization of scientific and technological archives work should be combined with the overall consolidation work for enterprises and establishments. Under the unified leadership of party committees, scientific and technological archives work should be directly managed by a chief engineer or responsible members in charge of production and technology. Organs suited to the scientific and technological archives work of the units concerned should be established. We should staff these organs with cadres and bring the scientific and technological archives work into line with our plans. Scientific and technological archives should be constantly checked and properly cared for. In addition, we should establish and strengthen an effective system of technical management and scientific and technological archives work. Necessary supervision and examination should be enforced.

Experience has proved that a task which is related to several departments is apt to become incoherent. After the conference of scientific and archives work jointly held by the State Economic Commission, the State Capital Construction Commission, the Scientific and Technological Commission and the State Archives Bureau, we hope that we will work in full cooperation and with unity of purpose to do our job well.

CSO: 4008



## SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

### BRIEFS

SHANGHAI SCIENTIFIC ASSOCIATION--The Shanghai Scientific and Technical Association held the first session of its Standing Committee on 5 July. Professor Li Guohao, chairman of the association, presided over the meeting. The meeting discussed the tasks of the association in the second half of the year and called for efforts to promote domestic and international academic exchanges and to popularize scientific and technological knowledge. It decided to set up four special committees--an academic committee, a committee for popularizing scientific and technological knowledge, an organizational work committee and an international academic exchanges committee. [OW132115 Shanghai City Service in Mandarin 2300 GMT 10 Jul 80 OW]

QINGHAI SCIENCE ADVISORY COMMISSION--Xining, 30 Jul--Recently the Qinghai Provincial People's Government set up a 24-member Scientific and Technological Advisory Commission. The commission held its first meeting on 26 July to discuss a long-term plan for developing science and technology in Qinghai. The commission's main tasks include making proposals on the policy, plans and measures for scientific and technological development, serving as a science consultant for the provincial CCP committee and the provincial people's government, evaluating the performances of high-level scientific and technological workers to determine if they deserve promotion or extra rewards, recommending competent scientific and technological workers to the departments concerned, introducing advanced technology from abroad, supervising the use of research funds and research equipment, and offering suggestions for the improvement of scientific and technological workers' living and working conditions. [OW311315 Beijing XINHUA Domestic Service in Chinese 0110 GMT 30 Jul 80]

GANSU LEADERS ATTEND LECTURE--According to our sources, the Gansu Provincial Party Committee, the provincial people's government and the Lanzhou PLA units recently decided to hold scientific lectures for leading cadres in the hope of raising their level of scientific knowledge to suit the needs of the four modernizations. The first lecture was held on the afternoon of 14 August at the (Mongmogong) auditorium. (Liang Hengzhou), vice president of the Lanzhou branch of the Chinese Academy of Sciences, was



invited to preside. He delivered a report entitled "The Concept of Space and Time Is the Basic Concept Formed by Mankind in Understanding Nature." Attending the lecture were principal responsible persons of the party, government and army organs including Song Ping, Xiao Hua, Du Yide, Feng Jixin, Zhao Chuqi, Qian Xueyi and Li Dengying. Leading comrades of various departments also attended. These science lectures will be held biweekly. [Text] [6K161142 Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 15 Aug 80]

CSO: 4008

## PUBLICATIONS

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## Building Structures

AUTHOR: HE Guangqian [0149 1684 0051]

ORG: Chinese Academy of Building Research

TITLE: "Some Problems in the Development of the Science and Technique of Contemporary Building Structures"

SOURCE: Beijing JIANZHULIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 2-12

TEXT OF ENGLISH ABSTRACT: The development of contemporary building design and construction has given rise to a series of new requirements to the science and technique of building structures. In this respect, the rational formulation of structural safety by the mathematical theory of statistics and the common unified design rules for different types of construction and material, the development of structural mechanics for raising the level of structural designs, the widening of the domain for the use of prestressed concrete structures, the application of new building materials in the evolution of traditional structures and the acceleration of the development of industrialized building structural systems should be listed among the important problems in the development of the science and technique of contemporary building structures and deserve our immediate attention and effort.

AUTHOR: None

ORG: Research Group on Multistory Apartment Building Structures

TITLE: "Investigation of Seismic Behavior for Multistory Apartment Building Structures with Cast-in-situ Shear Walls by Wall Form"

SOURCE: Beijing JIANZHULIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 13-27

TEXT OF ENGLISH ABSTRACT: In this paper, seismic behavior of the apartment building structures (5~6 stories) of cast-in-situ internal shear walls constructed with wall form and external walls of precast concrete panels or bricks has been investigated. The paper summarizes the items of research as follows: (1) test of 8-story and 6-story structural models (1/20-scale) on a shaking table, (2) test of a 3-story structural model (1/3-scale) under reversed cyclic lateral static loading, (3) test of 33 reinforced concrete shear walls (with and without openings) under reversed cyclic lateral static loading, (4) investigation of the damages of multistory apartment building structures in the Tangshan earthquake July 1976, (5) measurements of dynamic characteristics of existing multistory apartment buildings, and (6) examination of cracks in this kind of structure.

Strength, ductility and minimum percentage of reinforcement in the shear wall were presented. Collapsing process, dynamic characteristics and hysteretic behavior of this kind of structure were studied and evaluated. A method of analysis considering the spatial behavior of the walls was compared with the model test and satisfactory agreement was obtained.

\* XU Peifu [1776 1014 4395], WU Lianzhong [0702 1670 0112], CHEN Zhuoru [7115 3820 1172] and JING Tianfang [4842 1131 2397] participated in the study.

AUTHOR: None

ORG: Research Group on Panel Structures, Guangdong Building Design Institute

TITLE: "A Study on Cracking of the External Hollow Core Panel Wall Structures in Guangdong District"\*

SOURCE: Beijing JIANZHUYIGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 28-34

TEXT OF ENGLISH ABSTRACT: The aim of this paper is to clarify the causes of cracks occurring on the external hollow core panel wall structures. The deformation due to shrinkage of plain and reinforced concrete wall panels was calculated and converted into an equivalent temperature difference strain, the equivalent difference and ambient temperature difference were added up together, from which the temperature stress in wall panels was calculated and compared with the tensile strength of concrete. The causes of cracking were analyzed quantitatively for several possible temperature difference patterns and a measure for improving the design procedure is presented.

\* Article written by YU Qihong [0151 0796 1347].



AUTHOR: WEI Lian [7614 8834]  
DAI Guoying [2071 0948 3853]  
WANG Long [3769 7893]

ORG: All of the Chinese Academy of Building Research

TITLE: "Simplified Calculation of Nonlinear Earthquake Response of Multistory Multibay Framed Structures"

SOURCE: Beijing JIANZHUJIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 35-45

TEXT OF ENGLISH ABSTRACT: The various methods of analyzing nonlinear earthquake response of multistory multibay frames demand enormous amounts of computer memory and time and are too expensive for practical use. In this paper, an equivalent single frame model is proposed to replace the multiframed structures, the amounts of unknowns of joint displacements being much reduced and the computer work simplified.

A simplified method for analyzing inelastic earthquake response of multistory multibay frames is then presented and two numerical examples are given. Results computed by the proposed method, whether relative displacement between floors or absolute displacement of each floor, are all found to be rather close to those obtained by the current methods.

AUTHOR: None

ORG: Structural Safety Research Group

TITLE: "Development and Application of the Theory of Building Structural Safety"

SOURCE: Beijing JIANZHUJIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 46-60

TEXT OF ENGLISH ABSTRACT: The problem of building structural safety is an important subject of research in the theory of design for building structures.

The development of the current theory of building structural safety based on statistical mathematics is briefly illustrated, and the improvement of the current limit state design method in China by applying the second-moment probabilistic method is suggested. In conjunction with the statistical Live Loads data of office buildings in China, several important statistical characteristics of the variable loads are presented, and the way to determine partial safety factors by using the new analysis method for structural safety is discussed.

This paper reflects synthetically the status and results of the recent research work on building structural safety in China.

[Continuation of JIANZHUJIEGOU XUEBAO Vol 1 No 1, 5 Feb 80 pp 46-60]

\* Article written by: LI Mingshun [2621 2494 7311], LIN Zhongmin [2651 1813 3046], LI Jihua [2621 4949 5478] and SHAO Zhuomin [6730 0587 3046], with help from HU Dexin [5170 1795 3512], MA Kunzhen [7456 0981 6297] and BAI Shengxiang [4101 3932 5046].

AUTHOR: ZHONG Shantong [6988 0810 2717]  
WANG Yongchun [3769 3938 4783]

ORG: Both of Harbin Institute of Civil Engineering

TITLE: "Research on Analytical Theory of Axial Compression Member of Concrete Filled Steel Tubes"

SOURCE: Beijing JIANZHUJIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 61-71

TEXT OF ENGLISH ABSTRACT: Due to the fact that the steel tube behaves similarly as a core concrete, this paper analyzes the ultimate state of axial compression members by the strength theory and a formula is derived for computing the stability carrying capacity of the member and stresses under service stage by the elastic theory. The results of the proposed formula agree with the test data available in literature at home and abroad. Furthermore, the effects of creep, shrinkage and temperature of core concrete are investigated.

AUTHOR: HE Yihua [0149 2128 5478]  
FANG Shunshun [2455 1108 1912]  
QIAN Lihang [6929 0500 5300]  
WANG Suqiong [3769 4790 8825]

ORG: All of the Subgrade Institute, Chinese Academy of Building Research

TITLE: "Method of Determination of Subgrade Reaction for Box Foundation of Multistory Buildings"

SOURCE: Beijing JIANZHULIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 1, 5 Feb 80 pp 72-77

TEXT OF ENGLISH ABSTRACT: Although the computation of the subgrade reactions under box foundation on elastic subsoil has been studied for a long time, the problem is not well solved yet. The results obtained from various methods are quite different. Based on the measurement and analysis of subgrade reactions under box foundations of seven existing multistory buildings on Quaternary period soil and soft soil, reaction distribution curves for different subgrade and different length-width ratio of box foundation are obtained. The coefficients of the subgrade reactions are tabulated for practical use. The results computed by the proposed method are compared with those obtained from other methods. The proposed method is found to be simple and its results are rather close to the existing conditions.

AUTHOR: LIU Baiquan [0591 4102 6898]  
SHI Lulin [4258 4389 7792]  
GE Manyun [5514 2581 0061]

ORG: All of the First Design Institute, First Ministry of Machine Building

TITLE: "An Investigation with Measurement on the Transverse Crane Force in Industrial Buildings"

SOURCE: Beijing JIANZHULIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 1-9

TEXT OF ENGLISH ABSTRACT: The horizontal force of a crane in the design of industrial building structures is an important factor affecting both the safety and cost of the structure. This paper covers the measurement data obtained from 14 different industrial plants equipped with operating overhead cranes of capacity ranging from 5-75 tons. The transverse crane forces are found to be of three kinds, namely, the brake force, the wheel-stuck force, and the combination of these two forces in which the wheel-stuck force is the dominating factor. As a result of the statistical and theoretical analysis, formulae for computing the transverse crane forces are given in the paper.

AUTHOR: HU Bolong [2612 0130 7893]  
LU Weimin [7120 0254 3046]

ORG: All of Tongji University

TITLE: "Inelastic Analysis of Earthquake Responses of Single-Story Factory Buildings Taking Into Account Torsional Vibration in the Plane of Roofs"

SOURCE: Beijing JIANZHUYIGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 10-18

TEXT OF ENGLISH ABSTRACT: Research work in this paper includes inelastic analysis of earthquake responses of single-story factory buildings with roofs continuing to act as a whole unit under seismic action. In the case of a building being made up of spans with roofs at different levels, then each roof system is taken as a horizontal rigid diaphragm with its mass concentrated at its center of gravity. Therefore, there are three degrees of freedom (two translational and one rotational) corresponding to every mass.

According to the above model, a computer program was developed for the investigation of inelastic earthquake responses of equal-height or unequal-height multi-span single-story factory buildings subjected to ground motion in one or two directions.

AUTHOR: YIN Zhilin [3009 5347 7207]

ORG: First Design Institute, First Ministry of Machine Building

TITLE: "Shear Strength of the Lower Chord of the Reinforced Concrete and Prestressed Concrete Vierendeel Truss (Discussion on Shear Strength of Eccentric Tension Members)"

SOURCE: Beijing JIANZHUYIGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 19-30

TEXT OF ENGLISH ABSTRACT: The lower chord of a vierendeel truss, when loaded, is subjected to the combined action of prestressed compression, large axial tension, moment and shear. The analysis of the test results of the lower chords of 7 vierendeel trusses and 16 beams under combined tension, moment and shear shows that the calculation of shear strength of eccentric tension members by the formula of the flexure members of current code TJ 10-74 is not suitable and the calculated results are not safe.

On the basis of these experimental data, the practical formula for calculation of shear strength of the lower chord of the truss is derived, and the influence of prestressed compression and longitudinal tension are taken into account. The calculated results are in good agreement with the test results.

AUTHOR: ZHU Youlin [2612 1635 7792]  
LIU Yinsheng [0491 1377 3932]  
CHEN Rui [7115 5360]  
GUAN Qixun [7070 0796 0534]  
SHOU Guang [1108 0342]

ORG: All of the Beijing Design Institute of Architecture

TITLE: "The Model Test of Large Panel Multistory Building under Horizontal Load"

SOURCE: Beijing JIANZHUJIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 31-46

TEXT OF ENGLISH ABSTRACT: This paper reports the model test of an eight-story building with precast large panels under static and dynamic horizontal loads. The test results showed that the stress distribution within the structure and its rigidity were significantly influenced by the horizontal and vertical joints between the panels. The flexural rigidity of each wall pier under tensile conditions was quite different from that under compressive conditions.

The test verified that the stability, ductility and damping coefficient of the designed precast large panel building has sufficient earthquake resistance capability.

AUTHOR: SHEN Jumin [3088 5112 2404]  
WENG Yijun [5040 5030 6511]

ORG: Both of the Department of Civil Engineering, Qinhua University

TITLE: "The Deformation and Ductility of the Reinforced Concrete Members"

SOURCE: Beijing JIANZHUJIEGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 47-58

TEXT OF ENGLISH ABSTRACT: This paper investigates the relationship between the moment-curvature and the load-displacement of flexural members and members under combined flexural and compressive axial load at the different levels from cracking up to failure. Theoretical analysis of the whole process of the moment-curvature and the load-displacement by the use of computers is compared with the results of the tests. The comparison shows a good agreement between them. According to the test results from 107 members, an empirical formula of the ductility ratio of the displacement for flexural members and for members under combined flexural and compressive axial load is presented in the paper.

\* Also participating in this study were: HUANG Jiehong [7806 0094 1736], YE Zhiman [5509 4249 3341] and HUANG Yong [7806 0516].



AUTHOR: DONG Shilin [5516 4258 7792]  
LAN Tian [5663 1131]  
YAO Zhuozhi [1202 0587 2535]

ORG: All of the Institute of Building Structures, Chinese Academy of Building Research

TITLE: "Nonlinear Analysis of Guyed Masts"

SOURCE: Beijing JIANZHUGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 59-71

TEXT OF ENGLISH ABSTRACT: This paper discusses a rigorous nonlinear analysis of guyed masts by the matrix displacement method considering its spatial behavior. The formulas presented can be used in the calculation of statical forces, thermal stresses, settlement of supports, dynamic characteristics and seismic analysis for guyed masts located in plain or hill lands under general conditions. The structural analysis considers the axial deformation of the tower mast and corrects the inexact method used in the current calculation of thermal stresses. The theory presented was confirmed by a model study. The calculating method and its general computer program were used in the structural analysis of a 323 meter atmospheric pollution monitoring tower in Beijing.

AUTHOR: YAN Renjue [0917 0086 6030]

ORG: Central Building Research Institute, Ministry of Metallurgical Industry

TITLE: "The Phase Method for Determining the Coupled Vibration Parameters of Foundations"

SOURCE: Beijing JIANZHUGOU XUEBAO [JOURNAL OF BUILDING STRUCTURES] in Chinese Vol 1 No 2, 5 May 80 pp 72-77

TEXT OF ENGLISH ABSTRACT: The phase method for determining the coupled vibration parameters  $K_x$ ,  $K_y$ ,  $C_x$  and  $C_y$  of foundations is described in this paper. The mode superposition method was used in general for determining these parameters under certain satisfied conditions, otherwise the two equations of coupled motion cannot be separated into two independent normal mode equations. In the recommended phase method, the four parameters can be determined as long as two phase angles and two amplitudes are measured, and it would be generally valid even if the above-mentioned conditions were not fulfilled. In this paper, the general formulae are presented, the correctness of which is verified by the fact that the deduced special case agrees well with the usual approximate formulae.



AUTHOR: YIN Qifeng [1453 0366 0023]  
FANG Lihua [2453 0336 0037]

ORG: YIN of Department of Geophysics, Beijing University; FANG of China University of Science and Technology

TITLE: "A Plausible Interpretation of Delayed Evolution of Solar Activity Region"

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14, 30 Jul 80 pp 640-642

ABSTRACT: Ordinarily, solar activity region is marked by sunspots. Optical and radio observation of the activity region indicates that there are different expressions of activity in different layers (altitudes) of the solar activity region. For example, rotation of sunspots, solar flare activity, centimetric wave radio phenomenon, metric wave I source, etc. are solar activity phenomena of different layers, and sunspot rotation has a delay relationship with the production rate of solar flare. Kai pointed out that between centimetric wave slow changing source and metric wave I source there exists a relationship of 1-2 days of delayed evolution. Through a study of McMath activity region in Aug 78, the authors verified Kai's conclusion. Three years of statistical research (70-72) of metric wave I source by the authors indicates a close evolutionary relationship between the f number of flare activity and the intensity of metric wave I source. This paper was received for publication on 19 Oct 79.

AUTHOR: JIANG Zufan [3068 4371 0416]  
LI Taifeng [2621 1132 0023]

ORG: Both of Lushan Cloud, Fog Experimental Station, Central Weather Bureau

TITLE: "Altitude and Temperature of Cumulus Cloud Ice-crystallization in Jiujiang Region"

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14, 30 Jul 80 pp 643-644

ABSTRACT: Based upon 3 years (1963-1965) observation data with double transit theodolite, the altitude and temperature of cumulus cloud ice-crystallization in Jiujiang Region are reported. The mean altitude of Cu ice-crystallization is 9.3km, the minimum low is 7.2km; the mean temperature for ice-crystallization is  $-24^{\circ}\text{C}$ ; the highest temperature is  $-10^{\circ}\text{C}$ . Effects of the season and the Cu width on the ice-crystallization altitude are also observed and reported. This paper was received for publication on 25 Jun 79.

AUTHOR: HONG Yundong [7163 0645 1906]

ORG: Tianjin Institute of Geology and Mineralization, Ministry of Geology

TITLE: "New Genus-Species of Middle Triassic Apus Fossils in Xinjiang"

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14, 30 Jul 80 pp 645-647

ABSTRACT: The paper reports one new genus and three new species of freshwater apus. The fossils were obtained from the Xiaochuangou Formation in Tunkun County, to the southeast of Wulumuqi [Urumchi] Xinjiang, in gray-brown powdered sandstone, belonging to the Middle Triassic Period. The new genus and species are described.

This paper was received for publication on 25 Jul 79.

AUTHOR: ZHANG Ruobu [1728 1172 2672]  
TIAN Huixin [7444 1979 2450]  
FENG Zhixiong [1756 1807 1813]  
Ma Jinhong [7456 0679-0679 3932]  
HAN Fengming [7281 7364 7686]  
JING Zebai [2329 3419 5926]

ORG: ZHANG, TIAN of Chengdu College of Geology; FENG, MA of Wuhan College of Geology; HAN, JING of Xinjiang Bureau of Mines

TITLE: "A New Mineral--Ashanite  $(\text{Nb, Ta, U, Fe, Mn})_4\text{O}_8$ "

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14, 30 Jul 80 pp 648-650

ABSTRACT: Two years previously, the authors were carrying out mineralogical studies of rare metal pegmatite of a certain area of the Northwest and discovered a new mineral. It is a rich-niobium member of the Ixiolite series. The authors named it according to the name of the place of its discovery to be Ashan Kuang, Ashanite in English translation. This new mineral is described.

This paper was received for publication on 7 Nov 79.

AUTHOR: QIAN Zhongyi [5012 007 0001]  
LIU Shuhuang [0421 2885 3552]  
WANG Jingying [3076 7234 5391]  
MA Fengzhu [7436 7364 4594]  
QIAN Xueming [6929 7185 2494]  
CHEN Yunhe [7115 6663 3109]

ORG: YUAN, LIU, WANG, MA, QIAN of Shanghai Institute of Biochemistry,  
Chinese Academy of Sciences; CHEN of Shanghai Beer Plant

TITLE: "Application of Solidified Nuclease  $P_1$  in the Production of 5' -  
Nucleotide"

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14,  
30 Jul 80 pp 654-657

ABSTRACT: The authors used p,β-Sulphato ethylsulphonyl aniline (SESA)  
to join nuclease  $P_1$  of *Penicillium citrinum* sugar cane residue cellulose.  
In 1976, the experimental production of 5'-nucleotide in solidified enzyme  
was successful. The actual production rate of enzyme was raised 20 fold.  
Toward the end of 1977, factory production test was again satisfactory. The  
economic superiority of solidified nuclease  $P_1$  was proved and China's first  
relatively large industrial scale solidified enzyme enterprise was establish-  
ed. The solidifying process of nuclease and its applications are reported.  
This paper was received for publication on 19 Dec 79.

AUTHOR: CHENG Zhiqing [4453 1807 7230]  
XIAO Jincheng [5135 6930 3397]  
HUANG Xianting [7806 2594 1694]  
CHEN Denglong [7115 4098 7127]  
LI Jianquan [2621 1696 0356]  
HE Yanchong [0149 3508 5116]  
HUANG Shangren [7806 1424 0088]  
LUO Qingchang [5012 1987 2490]  
YANG Chaoming [2799 2600 2494]  
YANG Zanxi [2799 6363 3588]

ORG: All of Guangdong Provincial Institute of Tests and Analyses

TITLE: "A Study on the Chemical Structure of the Sex Information Agent  
of Asian Corn Borer"

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14,  
30 Jul 80 pp 658-661

ABSTRACT: Several existing corn borer sex information agents, z or E11-14:Ac,  
mixture of Z11-14:Ac and E11-14:Ac, and Z9-14:Ac, failed to attract male moths  
of corn borer in the fields. In 1977, therefore, the authors began to search

for the chemical structure of the sex information agents of corn borers in China, and EL-14:Ac and EL-14:Ac were subsequently identified. Synthesized E and EL-14:Ac in various ratios and mixtures were field tested and proved to be capable of attracting corn borer male moths. This paper was received for publication on 24 Oct 79.

AUTHOR: PAN Qionao [3382 0796 6385]  
LIU Zongshao [0491 1350 3390]  
XIE Bingfen [6200 0393 5358]  
TANG Wenxia [0781 7186 7209]  
GUAN Yintong [4619 5593 2717]  
SHAO Rongshuan [6730 2837 2164]

ORG: PAN, LIU, XIE of Institute of Oncology, Zhengshan College of Medicine;  
TANG, GUAN, SHAO of Institute of Complexes, Nanjing University

TITLE: "Research on the Antitumor Action of Platinum Complex

SOURCE: Beijing KEXUE TONGBAO [SCIENCE BULLETIN] in Chinese Vol 25 No 14,  
30 Jul 80 pp 662-664

ABSTRACT: For the purpose of comparing the antitumor action of bivalent and tetravalent platinum complexes, four tetravalent platinum complexes are synthesized:  $Pt(NH_3)_2(mal)(OH)_2$ ,  $Pt(en)(mal)(OH)_2$ ,  $Pt(en)(C_2O_4)(OH)_2$ , and  $Pt(en)Br_2(OH)_2$ . For comparison,  $Pt(en)(mal)$ ,  $Pt(NH_3)_2(mal)_2$ ,  $dis-[Pt(NH_3)_2Cl_2]$ ,  $Pt(NH_3)_2Cl_2(OH)_2$  were used. In animal experiments (large white mice), the rate of control of tumor growth was above 95 percent for three of the 4 tetravalent complexes. The effects of the bivalent complexes were found to be similar, but during the 95 days observation period after drug administration was stopped, there were 4/10 cases of recurrence when bivalent complexes were used. With tetravalent complexes, recurrence was very rare, and there were some cases of continuous remission after the treatment had completed. This paper was received for publication on 11 Dec 79.

AUTHOR: GU Dohun [6253 1795 2182]

ORG: Institute of Geology, Chinese Academy of Sciences

TITLE: "After Reading Professor Müller's TODAY's ENGINEERING GEOLOGY"

SOURCE: Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 1-5

ABSTRACT: The paper "TODAY'S ENGINEERING GEOLOGY" contains viewpoints of Professor Müller, President of the First International Society of Lithomechanics and one of the founders of the field, with regard to the inter-relationship between engineering and geology. It has been 5 years since that paper was published. The problems discussed in the paper have never been satisfactorily resolved, however. The key is a way to obtain cooperation among specialists of soil mechanics, lithomechanics, engineering geology, mining engineering, civil engineering, etc. There is indeed an internal and inseparable link among these fields, but how to coordinate them remains a subject requiring further deliberation. First, specialists of each of these fields should seek mutual respect and communication to supplement one another to serve engineering jointly. The political system of China is different from foreign countries yet there is also the need of those of one field to acknowledge the importance of the fields of others for the purpose of guaranteeing engineering safety, reducing cost, and shortening the construction period.

AUTHOR: LI Zhongchun [2621 0112 2504]

ORG: Tianjin Survey Designing Academy of the Ministry of Water Conservancy

TITLE: "On Problems of Developing Engineering Geology"

SOURCE: Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 6-7

ABSTRACT: Although the field of engineering geology has had a history of 50 years, 2 different schools of thought remain still. For one school, mechanics of materials is the foundation and engineering geology is a branch of engineering technology. It regards soil and rocks as physical materials. The other school regards either pedogenesis or traditional geology as the foundation to view engineering geology as a branch of geology. To this school, soil and rocks are geological bodies belonging to the realm of geology. The author maintains that engineering geology is a science of studying the relationship between the geology of the soil-rock body and its mechanical effect, and the way of development of engineering geology must be based upon a foundation of geology and a major body of mechanics. On the basis of this understanding, the author proposes 5 component parts to form the contents of engineering geology.



**AUTHOR:** SUN Guangzhong [1357 1684 1813]  
ZHOU Ruiguang [0719 3843 0942]  
GUO Zhi [6751 1807]

**ORG:** All of Institute of Geology, Chinese Academy of Sciences

**TITLE:** "Relationship Between Strength and Structure in Cracked Sedimentary Rock Specimen"

**SOURCE:** Beijing GONGCHENG KANCHU [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 8-11

**ABSTRACT:** Whether or not a size effect exists in the mechanical property of a rock specimen is a problem long debated in lithomechanics. In view of the principle of mechanical action, a rock body may be divided into 3 mechanical media: the block medium, the cracked medium, and the continuum medium. Generally speaking, in continuum medium rock body does not have size effect, or the effect is not obvious. The size effect, the authors believe, is a reflection of the structure characteristics which include shape, size, density, etc. For this reason, the term structure effect is used to include size and an experiment is carried out to determine the relationship between strength and structure in sedimentary rocks. Results indicate that the structure effect index varies in different rocks. Compared with limestone, that of slate is twice as great. The method, the procedure, and the results of the experiment are reported.

**AUTHOR:** None

**ORG:** CONSTRUCTION REGULATION OF REGIONS OF WET DEPRESSING TYPE LOESS  
Revision Team

**TITLE:** "Load Capacity of Wet Depressing Type Loess Foundation"

**SOURCE:** Beijing GONGCHENG KANCHU [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 12-17

**ABSTRACT:** Experience in engineering practice and experimental research data had demonstrated that the CONSTRUCTION REGULATION OF REGIONS OF WET DEPRESSING LOESS, as it was formulated in 1966, contained several major problems. The regulation was revised in 1978. Some supplementary regulations were added in consideration of these problems. On the basis of surveys, research, and specific tests, this paper introduces the principles of determining the maximum load capacity and the permissible load capacity of loess that depresses when wet. Problems relating to the principle and method of determining the load capacity and the compilation of permissible load table are discussed.



**AUTHOR:** YANG Xiaoyin [2799 2556 7299]

**ORG:** Survey Company of First Ministry of Machine Industry; Shaanxi Provincial Institute of Construction Sciences

**TITLE:** "Using Saturation Compression Test lgp-s Curve to Determine the Initial Pressure of Wet Depression of Loess"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 18-21

**ABSTRACT:** The CONSTRUCTION REGULATION OF REGIONS OF WET DEPRESSING LOESS, 1978 states that the wet depressing initial pressure may be determined with either the load test or the laboratory compression test, using p- $\epsilon$ . In the Soviet Union, a simple method has been proposed using one soil specimen to test the compression coefficient for determining the relative wet depression of loess. Problems with these methods are discussed. The paper proposes the use of saturation compression test lgp-S curve to determine the initial wet depression pressure. The test error is minor and the result is not affected by the original moisture content of the specimen. The method has obvious significance in mechanics as well. But, compared with load test data, the initial pressure value obtained with the method suggested in the paper is generally smaller than  $1\text{kg/cm}^2$ , however. The method may have certain limitations. Further testing and experimentation are needed to ascertain its general significance.

**AUTHOR:** ZHANG Lanchuan [1728 5695 1557]  
GU Jiehui [7357 3381 2037]

**ORG:** Both of Shaanxi Provincial Academy of Comprehensive Survey

**TITLE:** "Preliminary Application of the Simple Method of Determining the Wet Depressing Characteristic of Loess"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 22-24

**ABSTRACT:** The newly revised CONSTRUCTION REGULATION OF REGIONS OF WET DEPRESSING LOESS, 1978 states that the initial pressure of wet depression should be determined by the dual-line or single line methods of laboratory compression test which requires many specimens. As soil structure is uneven and errors occur in the testing process, precise determination is unavoidably affected. The authors applied the SIMPLE METHOD OF PRECISELY DETERMINING THE RELATIVE WET DEPRESSING CHARACTERISTIC OF LOESS, suggested by M.N. Goldshtein, N.A. Makarenko (GROUND FOUNDATION AND SOIL MECHANICS, USSR No 1, 1978) to carry out an experiment. Judging from results of that experiment, it appears that the simple method can precisely determine the initial pressure of wet depression as well as calculate the wet depression coefficient under different pressures. The effect of uneven soil structure and the amount of work are reduced as well. Data of 3 different testing methods are compared and reported.

**AUTHOR:** DING Wenhui [0000 2429 1102]

**ORG:** Shanxi Provincial Academy of Construction Designing

**TITLE:** "Preliminary Attempt of Using Regression Analysis Method to Determine Loess Wet Depression Coefficient"

**SOURCE:** Beijing GONGCHENG KANCHI [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 24-26

**ABSTRACT:** China's newly published CONSTRUCTION REGULATION OF REGIONS OF WET DEPRESSING LOESS, 1978 (TJ25-78) requires laboratory compression test, which is very labor and time consuming. With increased extension of mathematical statistics and electronic computers in engineering geological survey, the author is inspired to attempt the use of regression analysis and the computer to carry out a relevant analysis for selecting the best regression equation to determine the wet depression coefficient. Major factors affecting loess wet depression coefficient, such as regional characteristics, the age of the soil formation, the geological and geomorphological conditions, etc. of 5 loess areas of Shanxi Province are collected to produce data of natural porosity, unit volume/weight, moisture content, and fluid limit. The above information is compiled into 238 groups before establishing the respective wet depression coefficient of each group. Various regression equations obtained by using computer programing are discussed.

**AUTHOR:** ZHANG Baoshan [1728 1405 1472]

**ORG:** Shenyang Survey Company, Ministry of Metallurgical Industry

**TITLE:** "More Discussion of the Layer Probing Method to Determine Foundation Soil Shear Wave Speed for Treating Seismic Origin and the Method of Computing Interlayer Speed"

**SOURCE:** Beijing GONGCHENG KANCHI [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 27-29

**ABSTRACT:** "Using Layer Probing Method to Determine Foundation Soil Shear Wave Speed for Treating Seismic Origin and the Method of Computing Interlayer Speed" is a paper published in the No 4, 79 issue of the *Journal*. This paper is a follow-up to investigate the characteristics of various types of elastic waves produced at the seismic origin and their interrelationship. The characteristics of the SH wave are emphasized, and the method of computing the shear wave speed is proposed accordingly.

**AUTHOR:** None

**ORG:** Survey Office, Taping Oil Field Scientific Research Designing Academy

**TITLE:** "Brief Introduction of KZC-50 Complex Fluid Pressure Engineering Geology Drilling Machine"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp30,11

**ABSTRACT:** The KZC-50 complex fluid pressure engineering geology drilling machine is a mult -property drill, having the 4 functions of vibrating, rotating, punching, and pressuring. It can be used to drill to probe, take soil sample, and do static touch probing work. The work procedure is performed with fluid pressure. It is easily operated and it does not require hard labor. The major structure, the characteristics, and the major technical parameters of the drill are given.

**AUTHOR:** None

**ORG:** Survey Team, Southwest Metallurgy Geology Survey Company; Measurement Division, Office of Changjiang [Yangzi] Valley Planning

**TITLE:** "Experimental Study on Vertical Line Deviation of Triangulation Net in an Alpine Mine"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 31-39

**ABSTRACT:** As a mine control net was being arranged in an alpine region of Yunnan Province, a great deviation of the vertical line was discovered during astronomical surveying. The deviation was such that it would necessarily affect the precision of the triangulation net. For the purpose of locating the principle of the occurrence of deviation, astronomical longitude and latitude of 15 points were determined from triangular points within the experimental region and more than 40 gravitation points were determined. Electronic computer was used in calculating the vertical line deviations. The Procedure and resultant data of the experiment are reported.

AUTHOR: BAI Gengling [4101 704 1730]

ORG: Hubei Comprehensive Survey Academy

TITLE: "Necessary Precision of Measurement of Deformation of Structures in a Region of Expansion Soil"

SOURCE: Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 40-45

ABSTRACT: Structures may be destroyed in large groups in regions of expansion soil to cause great losses. Under the auspices of the Architectural Research Academy of the State's Architectural Committee, an Expansion Soil Foundation Design Special Subject Research Team was organized from drafting specialists of related departments of architectural designing, engineering geology, and surveying. The team carried out a large amount of surveys and investigation in Guangxi, Yunnan, Hubei, Sichuan, Henan, Hebei, and Anhui Provinces and presented a report in 1976; accordingly the REGULATION OF CONSTRUCTION TECHNIQUE IN REGIONS OF EXPANSION SOIL (Draft) was established in Dec 77. The author participated in the work of the team. Based upon his experience and understanding of the survey work, he discusses his opinions regarding the degree of precision necessary for measuring deformation of structures in regions of expansion soil.

AUTHOR: ZHAI Weitai [5049 3634 2905]  
BAO Dazhong [0545 1129 0022]

ORG: Both of Kunming Metallurgy Design Academy

TITLE: "Relationship of Area and Depth and Length of Base Line in Ground Surface Photography"

SOURCE: Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 45-49

ABSTRACT: Ground surface stereophotography is a technique being increasingly frequently applied in survey work in China. At present, the surveyors using this technique are concerned with the reasonable arrangement of base lines in accordance with the condition of the region being surveyed. The paper suggests a method of first calculating the area and the depth of the object on the ground surface to be photographed to obtain 2 parameters. The relationship between the 2 parameters and the length of a base line is discussed before explaining the method of using the 2 parameters as reference data in the process of selecting the base line.

AUTHOR: LI Bingjun [1660 1795 9478]  
YU Wenjin [0060 419 6930]

ORG: Both of Dalian College of Engineering

TITLE: "Simplified Form of Side Measurement Independent Quadrilateral Lock Condition Equation"

SOURCE: Beijing: GEOTECHNICAL ENGINEERING [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 50-5

ABSTRACT: On the basis of a condition equation of side measurement quadrilateral lock suggested by A. Tarsky-Hornoch, the paper proposes a simplified form. The process of deriving the simplified equation is explained.

AUTHOR: KANG Dehua [1660 1795 9478]  
YAN Boduo [0917 0130 6995]

ORG: Both of Shandong Provincial Survey Company

TITLE: "An Equation of Direct Computation Coordinates for Three-Side Convergence"

SOURCE: Beijing: GEOTECHNICAL ENGINEERING [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 53-54

ABSTRACT: This paper gives an equation for direct computation of three-side convergence point coordinates. As there are 3 forms of convergence of 3 sides, the equation may be modified to accommodate the condition. The distance of each side should be in units of km when the equation is used for computation, but attention should be given to retain a number of effective decimals to guarantee precision.

AUTHORS: CHANG Shupiao [1603 1105 7316]  
SHI Xinyuan [2657 9515 3193]  
WANG Ruyun [3769 3043 3768]

ORG: CHANG of Survey Company, Fifth Ministry of Machines; SHI of Survey Company, Fourth Ministry of Machines; WANG of Survey Company, Third Ministry of Machines.

TITLE: "Several Problems in Appraising Ground Water Resources"

SOURCE: Beijing GONGCHENG KANJI [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 56-60

ABSTRACT: After learning the document, REGULATION OF HYDRO-GEOLOGICAL SURVEY OF WATER SUPPLY (TJ27-75) the authors find themselves in agreement with the concepts and methods established in the document for appraising ground water resources. With respect to actual cases of appraisal, 2 types of opposite results occurred. In cases of cities, factories, and mining areas, such as Xi'an, the appraised result is too low. In areas, such as Houma, and certain areas of Shaanxi, the appraisal is too high. In the process of hydro-geological survey, the condition and quantity of ground water supplement under natural conditions are considered, but the interrelationship of supplementation and consumption under the condition of well mining of water is neglected. On the basis of an equation for computing the quantitative changes of ground water under the condition of artificial withdrawal of ground water, this paper discusses concepts and principle of appraising ground water resources.



AUTHOR: ZHAO Bencheng [6398 2609 6134]  
LUO Xinhong [5012 2430 7703]

ORG: ZHAO of Southwest Survey Brigade, Surveying Company, First Ministry of Machines; LUO of the Fourth Designing Academy, First Ministry of Machines

TITLE: "A Method of Determining Ground Surface Shift"

SOURCE: Beijing GONGCHENG KANCHU [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 55, inside back cover

ABSTRACT: For observing and determining ground surface shift in landslide regions, this paper introduces a control line deviation method. With it, only a few control points are needed, the amount of field work is light, and the computation process is extremely simple. The method, of course, would not be economically feasible, if many survey points must be irregularly arranged.

AUTHOR: CHEN Mengxiang [7115 1125 3574]

ORG: Bureau of Hydro-geology, Ministry of Geology

TITLE: "Classification of Ground Water Survey Types and Several Related Problems"

SOURCE: Beijing GONGCHENG KANCHU [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 61-63

ABSTRACT: REGULATION OF HYDRO-GEOLOGICAL SURVEYING OF WATER SUPPLY (TJ27-78) has been officially published for test implementation and the contents of the regulation were introduced in its entirety in the No 4, 79 issue of the journal. While learning the document, several direct or indirect problems came to mind. In separate section problems of classifying ground water survey types, scale of engineering of the source of water supply and quantity of water need, classification of ground water reserves, and grading reserves into classes are discussed. The author hopes that symposiums or special subject discussions of the regulation may be desired to revise and supplement it to meet the needs of future development of science and technology.

**AUTHOR:** WANG Qiangzhong [3769 1730 1813]

**ORG:** Shanxi Comprehensive Survey Academy

**TITLE:** "Preliminary Discussion of the Application of Permeability Coefficient in Ground Water Resources Appraisal"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 64-67, 61

**ABSTRACT:** In evaluating ground water resources, opinions vary with regard to permeability coefficient  $K$ . For example, some believe that for a uniform, level aquifer of equal thickness,  $K$  is constant, but others believe it is a variable, or that the true  $K$  is a constant while the pseudo  $K$  is a variable, etc. This paper analyzes the current applications of  $K$  under 5 different conditions and the reasonableness of such applications.

**AUTHOR:** LI Jinqi [2621 1367 3825]

**ORG:** Anhui Provincial Academy of Construction Designing

**TITLE:** "Cyclic Characteristic of Ground Water Supplement and Quantitative Appraisal of Ground Water Resources"

**SOURCE:** Beijing GONGCHENG KANCHA [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 68-71

**ABSTRACT:** The ground water supplement cycle proceeds under a given water storage structure and its characteristic is controlled by the geological structure and hydrological type of the water storage structure, the modern geographical condition, and human factors. This paper classifies and describes the supplement cycle characteristics of some common water storage structures and their relationship with methods of evaluating the quantity of ground water resources.

APPROX: 18 December 1941 1077 19317  
LA 1000 1077 19317

Old: Both of Changchun Water Supply and Drainage Engineering Academy, and  
Bureau of Urban Construction

**TITLE:** "Problem of Pollution of Urban Ground Water Sources"

SOURCE: Beijing CONQUEST KANGHA [ENGINEERING SURVEY] in Chinese No 4,  
Jul 60 pp 72-73

**ABSTRACT:** In the Northeast, the water sources depend primarily upon surface water for supplement; therefore, the quality of the ground water is directly related to that of the stream water. As the water is withdrawn, the water table drops to induce seepage of stream water. In the coastal region, there is the problem of invasion of sea water to pollute the ground water. Industrial waste and bio-waste also pollute the ground water of cities. In cities of concentrated asbestos, rubber, pharmaceuticals, aluminum, dyestuff, cement, and machinery production, heat pollution may raise the temperature of the ground water to 13°-17°C, while in the suburbs, the ground water temperature is generally 6°-9°C. These 4 types of pollution of the ground water in urban areas are described.

AUTHOR: CHEN Shuliang [7115 5089 7227]

ORG: Shanxi Provincial Comprehensive Survey Academy

TITLE: "Preliminary Investigation of Chemical Characteristics of Water in the Endemic Regions of Huanglong and Yichuan"

SOURCE: Beijing GONGCHENG KANJI [ENGINEERING SURVEY] in Chinese No 4, Jul 80 pp 76-79

**ABSTRACT:** The 2 counties of Huanglong and Yichuan in Northern Shaanxi Province are endemic regions of Keshan and Kaschin-Beck diseases. The basic characteristic of the water chemistry of the area is low mineralization and weak alkaline water of a pH of 7.2-7.9. Survey indicates that the water of mildly endemic areas has poor  $\text{SO}_4^{2-}$  and  $\text{Mg}^{2+}$  contents; the  $\text{NO}_3^-$ ,  $\text{NO}_2^-$ , Sr, and Ba contents are not high. The water of severely endemic areas has low  $\text{SO}_4^{2-}$ ,  $\text{Mg}^{2+}$  contents and relatively high  $\text{NO}_3^-$ ,  $\text{NO}_2^-$  contents; incidence of both diseases among farmers drinking this type of water is above 50 percent. Water specimen of extremely severe endemic areas is not low in  $\text{SO}_4^{2-}$ ,  $\text{Mg}^{2+}$  contents of  $\text{NO}_3^-$ ,  $\text{NO}_2^-$  are relatively high, and contents of Sr, Ba are also relatively high. Keshan disease will start after drinking this water for several months. In some villages, 70 percent inhabitants are victims of the 2 diseases. Measures to filter and reconstruct the water or to provide diet supplements of  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$  and  $\text{SO}_4^{2-}$  to reverse the situation are suggested.

## Geography

AUTHOR: LI Chunfen [2621 2504 5358]  
WANG Enyong [3769 1869 3196]  
ZHANG Tongzhu [1728 0681 6999]  
WU Jihua [2976 0679 5478]  
LIU Shuren [0491 2885 0086]  
CHEN Ershou [7115 1422 1108]

ORG: None

TITLE: "Thirty Years' Geographical Education in China (1949-1979)"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 97-107

TEXT OF ENGLISH ABSTRACT: Since the founding of the PRC, geographical education in universities, colleges and schools has made great achievements, particularly in establishing geography departments, setting up specialities, training of teachers and geographical scientists, compiling and editing teaching materials and text books, improving teaching quality, carrying out scientific research and popularizing geographical knowledge, etc. For the sustained and healthy development in the years to come, especially at a time when the long-expected four modernizations are being carried out today, it is necessary to

[Continuation of DILI XUEBAO Vol 35 No 2, Jun 80 pp 97-107]

look back on the course of development and summarize the gains and losses.

The first department of geoscience was founded in 1919 in the Higher Normal College of Nanjing (now the University of Nanjing) with Dr. Co-ching Chu [ZHU Kezhen], a climatologist and the late president of the Geographical Society of China, as the head. One of its three sections was geography. In the 1920's and 1930's, a number of departments were established successively. From then until liberation in 1949, the departments were quite small, generally with a staff of about 10 and an enrollment of not more than 50. In a word, in old China the development of geography was rather slow, and most of the graduate students engaged in teaching in middle schools, bringing little into play in national productive construction. Since liberation in 1949, China has entered a new stage of development in socialist revolution and socialist construction. By 1952, in order to adapt to the needs of national construction, the institutions of higher learning underwent a nation-wide adjustment. Geography departments fell into two categories, one in the comprehensive university and the other in normal college (university). The main task of the former is to train scientific workers, whereas that of the latter is to train teachers for the middle schools. Since then, great changes have occurred in geography in higher education. These changes arose from the great expansion of the teaching of the subject and the carrying out of research work. A recent list gives about 35 departments, most

of them of a size that would have been undreamed of in the preliberation period. Students graduated amount to about 40,000. As a result of the emphasis laid upon the adaptation to the needs of the related government departments and production units, there emerged in comprehensive universities new specialties related to both research and teaching interests. It is noteworthy that there came up a distinct swing in favor of the systematic approaches evident in both physical geography and economic geography. The courses offered were deepened and broadened in content to a greater extent than before. But it must be pointed out that there was little regard paid to cultural geography and an increasing gap was made between physical and economic geography. In addition, the idea of geography as a "point of view" as an integrating and synthesizing discipline was losing ground. Regional geography was deprived of its position as the core of geography and even disappeared in curriculums. In comprehensive universities as well as in normal colleges important changes were also reflected in the strengthening of field training. Both senior and junior students were given a specific length of time for fieldwork training, including the productive practice in connection with the tasks designated by the related government departments or other productive units. The teachers and senior students usually take the occasion of productive practice to participate in comprehensive expeditions, resources surveys, drainage-area planning, agricultural regionalization, desert control, atlas editing, etc. These activities are of great

importance not only in carrying out the research work designated, but also in the promotion of teaching quality. In normal colleges students at the fourth year level take four to six weeks of teaching practice instead. At present, in both universities and colleges graduate studies are being extended either in number of students or in specializations they pursue.

With the rapid development of the middle and primary schools since liberation, geographical education has enlarged its range of popularization among the young generations. In 1979 students studying the course of the regional geography of China at the first-year level numbered 20 million. In the early and middle 1950's, all but the graduating class took geography courses totaling 12 class hours a week. Stress was laid on physical aspects for the junior students and on economic aspects for the senior ones. The text books or teaching materials, whether in viewpoint or scientific level, were greatly improved. In addition, extracurricular activities were developed with vigor. But in the late fifties, the five courses were reduced to two and the class hours were cut from 12 to 5. At the time when the "gang-of-four" ran wild, even the remaining two courses were cancelled. In some schools geographical education was practically nonexistent, usually with sporadic reports on current affairs as substitutes. It was not until the downfall of the "gang-of-four" that geographical education resumed its spirit. Courses of regional geography were restored and text books,



reference pamphlets and related periodicals resumed publication. But in comparison to the circumstances prior to 1958 there exists a gap. There are only two courses of regional geography about China and the world offered in the first and second years in middle schools with five class hours a week, which accounts for less than 2 percent of the total class hours. Apparently this does not provide the students with enough geographical knowledge, which can hardly arouse their interest in geography. As a result, at the entrance examination very few of them enter their names in the department of geography or in that of other disciplines of geoscience. This is the point which should arouse our serious attention. It remains to be solved immediately, or it will greatly affect the development of geoscience in general and geography in particular.

The New Long March on the four modernizations calls for a cooperative effort from all of us in comprehensive universities, normal colleges and schools. We are now in a very favorable position to make greater progress in geographical education.

AUTHOR: SHEN Yuchang [1088 1768 2490]  
ZHU Dakang [1561 1129 1660]  
TAN Jian'an [6221 6015 1366]  
LIAO Ke [1675 0944]

ORG: All of the Institute of Geography, Chinese Academy of Sciences

TITLE: "The Orientation and Task of Geography in China--A Discussion of Some Problems"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol. 35 No. 2, Jun 80 pp. 108-115

TEXT OF ENGLISH ABSTRACT: 1. On the problem of the nature and object of geography:

We consider that the nature and object of a discipline is determined by the contradictions it contains. Geography is a discipline the object of which is to study the contradictions between man and environment (including geographical conditions and human conditions). The nature and content of the contradictions between man and environment vary incessantly along with the development of human society and the progress of natural science and technology, but contradictions exist everlastingly. That is the reason that geography possesses great vitality.



II. On the problem of fundamental theories and basic work of geography:

We consider the following aspects as the fundamental theories of geography:

(1) The law of matter and energy transition in the geographical environment, and the regional differentiations manifested by it; (2) the theory of geographical zonation; (3) the theory of the relationship between man and environment; (4) the theory of regional assemblage of productive forces; and (5) the theory of the structure, formation and evolution of geographical environment.

III. The problem of modernization of geography in China.

It is necessary, first of all, to have a great number of geographers capable of mastering modern science and technology if we want to modernize geography in our country. Therefore, we must train teachers and increase the laboratory facilities and instrumental equipment of the geographical departments of the key universities. Then, improvements should be made in the method and technology by establishing a network of stationary and semi-stationary geographical stations, setting up simulation laboratories of the geographical processes, building up a system of analyses and applications of remote sensing imageries, and finally, by setting up a system of automatic analyses and mapping of geographical information and a data bank of the information of geographical environment.

IV. How geography can serve the four modernizations in our country.

We put forward the following three aspects as the most important areas in which

we geographers can work and serve the four modernizations:

(1) In agriculture, mainly including research into the development of the capacity of agricultural production, agricultural regionalization and the compilation of maps of landforms, land types, land uses and land resources on the scale of 1:1,000,000.

(2) In the rational utilization and protection of environment, including the way to utilize properly the natural environment and to improve the already deteriorated environment, and also the problems of pollution and protection of the natural environment.

(3) In industrial and other economic constructions, inclusive of the distribution of industries and the development of the regional differentiations, regional planning, the distribution of cities and city planning.

In addition, to reinforce the geographical education in the primary and middle schools, to popularize geographical knowledge and to raise the level of science and culture of our whole nation are also important tasks for us geographers to fulfill.

\* The following provided assistance: ZHOU Tingru [0719 1694 0320], WANG Nai-liang [3769 0035 2856], YANG Wuyang [2799 0710 2254], CUI Haiting [1508 3189]

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0080], CHEN Shupeng [7115 6615 1756], WU Chuanjun [0702 0278 6874], ZHAO Song-qiao [6392 2646 0829], GAO Yongyuan [7559 3144 3293], SU Shiyu [5685 2514 7183], SUN Huinan [1327 1920 0589], ZHANG Piyan [1728 0012 6678], XIONG Yi [3574 1837], TANG Qicheng [3282 1142 2052], CHEN Yongzong [7115 3057 1350], CHEN Zhilong [7115 1807 3237] and JIN Desheng [6855 1795 3932].

AUTHOR: QIU Baojian [8002 1405 0494]  
LU Qiyao [4151 0366 1031]

ORG: QIU of the Institute of Geography, Chinese Academy of Sciences; LU of the Department of Meteorology, Nanjing University

TITLE: "A Tentative Regionalization of Agroclimate of China"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 116-125

TEXT OF ENGLISH ABSTRACT: 1. In the first step, three large regions are divided to reflect the combined effect of hydrothermal conditions. In the northwest, the water insufficiency hampers the function of warmth; in the Tibetan Plateau, the low temperature hinders the full utility of water; it is only in the monsoon area, where precipitation occurs in the warm period, that the water-heat combination yields better results. These three regions are of order 1. 2. Regions of order 2 are based on the main crops and cropping systems. Taking the accumulated temperature above 10°C ( $\Sigma t$ ) as the main index, the subsidiary indices for the regions of high accumulated temperature are the temperature of the coldest month ( $T_M$ ) and the mean absolute minimum temperature of the year ( $T_{AM}$ ); for the regions of low accumulated temperature, the temperature of the warmest month is adopted.

3. For regions of order 3, the aridity (K) is adopted as the main index, based on the formula  $K = \frac{0.16\sum t}{t}$ . Due to the fact that the above formula used the  $\sum t (>10^{\circ}\text{C})$  and the dry period in most areas of China appears in the period  $<10^{\circ}\text{C}$ , a subsidiary index based on the formula  $D = \frac{\sum d}{t}$  is adopted here to show the actual duration of the wet, moist, semiarid and arid periods respectively.
4. The result of regionalization is shown in map 3.

Finally, a discussion is made on the significance of agriclimatic regionalization with respect to the development of agriculture. There are some problems, such as the cultivating of rubber trees as far north as the subtropical belt, tea as far north as the Shandong Peninsula, and sugar beets as far south as the Chang Jiang Valley, to expand the acreage of thermophilous crops into northeastern China and increasing the doublecropping inappropriately in many places. An agroclimatic regionalization may solve these problems.

AUTHOR: SHEN Yuancun [3747 0337 2625]

ORG: Institute of Geography, Chinese Academy of Sciences

TITLE: "Land Types and Their Transformation Measures in the Three-Rivers Plain, Heilongjiang Province, China"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 126-136

TEXT OF ENGLISH ABSTRACT: The famous Three-Rivers Plain is located at the junction area between the Heilong Jiang, the Songhua Jiang and the Wusuli Jiang. It is now one of the major reclamation areas in China.

The present article tries to classify the land types of the Three-Rivers Plain and to discuss chief measures for transforming the natural environment. It is based on fieldwork performed in 1978 on large-scale mapping of the Victory State Farm, which is located at the eastern part of the Three-Rivers Plain. Then, with the help of Landsat images, 1/500,000 topographic maps, as well as field observations, a map of land types for the whole Three-Rivers Plain (1/500,000) was compiled in 1979.

The term "Land" is treated as the integration of all physical factors in a site,

while landform, soil and vegetation are used as chief criteria for classifying the land types. Four land types of the first category (land system) and 10 land types of the second category (land units) are identified in the Three-Rivers Plain.

Major measures for transforming the natural environment of the Three-Rivers Plain are: (1) An overall planning, with present emphasis laid on reclamation of arable virgin lands; (2) For an integrated use of all marshy lands; (3) To control low temperature and frost hazards and to make better use of solar radiation; (4) To meliorate the whitish glei soils which are distributed extensively in the central part of the Three-Rivers Plain; (5) To conserve and improve the broad-leaved forests in the surrounding hilly lands.

\* The following assisted with the present study: ZHAO Songqiao [6392 2646 0829], REN Honglin [0117 3163 2651], YANG Liulin [2799 2692 2651], FANG Guangdi [2455 0342 6611], XU Huaizun [1776 2037 1415], YANG Ji'ao [2799 4949 2407] and CHEN Jingxin [7115 2529 2450].

AUTHOR: CUI Zhijiu [1508 0037 0036]

ORG: Department of Geography, Beijing University

TITLE: "Essential Features of the Development of Glacial Landforms on Qinghai-Xizang Plateau"\*

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 137-148

TEXT OF ENGLISH ABSTRACT: For the discussion on the essential features of the development of glacial landforms on the Qinghai-Xizang Plateau, it is necessary to go further into the classification of glacial landforms: cross section of the glacial trough may be subdivided into narrow-deep, medium and wide-shallow types; longitudinal profile may be subdivided into multi-steps, mono-step and smooth types; in cirque and neve basin may be distinguished single layer and double layer structure; various types of peak appear in glacial region, e.g. the primeval Muztagata type (Over-turned basin type), Zhuo Aoyou type (Cap type), Bogda type (Pen rack or saw tooth type), Qomolangma type (Pyramidical type) and lastly the Qogir type (Horn type). This shows that not all peaks in the glacial region are hornshape which represent only the feature of the last stage.

According to the analysis of the development and distribution of the various

types of glacial landform, we found that the factors influencing the development of glacial landforms are pre-glacial landform time rock structure and climatic conditions. Based on the assemblage of glacial landforms and their distribution, two glacial geomorphic regions may be distinguished in the Qinghai-Xizang Plateau: 1) The low mountain and wide valley glacial landform region. This includes the north slope of the Himalayas, the Gangdises shan, the western and middle sections of the Nyainqen Tanglha shan, the Tanggula, the south slope of the Kunlun shan, the Bayan Har mountain and the Anyemaqen shan. They belong to the mountain of the interior of the plateau and its neighboring mountain. The characteristics of the glacial landforms are: over-turned basin and cap type of peak of early stage, mostly wide shallow, single step or smooth type of trough valley, with low valley wall and few hanging valleys; few cirques or neve basins which are side shallow with low density and few layers. These are reflections of the unimportant of the differential movement of the mountain. The pre-glacial landforms are gentle, with shorter glacial history, weak dissection in interglacial period, and a relatively dry climate. 2) The other region is the glacial geomorphic region of high mountain and deep gorges, including chiefly the outer face of the border lands of the plateau (the inner face belongs to the first region), e.g., the south slope of the Himalayas, the mountainous area of southeast Xizang, the Hengduar Shan (including Yulong Shan of Yunnan) and the Kunlun Shan. Characteristics of glacial landforms are in

sharp contrast to the first region. There are reflections of the more important differential movement of the mountain. Pre-glacial landforms are deep and narrow, with longer glacial history, strong dissection in interglacial period and a climate more favorable to development of glacial landforms (in the southern region). From the above descriptions it shows that the great variety of the development and the distribution of glacial landforms follows certain general rules.

\* The following assisted with the present study: ZHANG Xiansong [1728 4382 2646], LI Jijun [2621 0679 0971], ZHENG Benxing [6774 2609 5281], XIE Zichu [6200 5261 2806] and WU Xihao [0702 6932 3185].



AUTHOR: ZHANG Xiangsong [1728 4382 2646]

ORG: Lanzhou Institute of Glaciology and Cryopedology, Chinese Academy of Sciences

TITLE: "Recent Variations in the Glacial Termini Along the Karakorum Highway"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 149-160

TEXT OF ENGLISH ABSTRACT: Present glaciers along the Karakorum Highway are located at 35-39° N latitude and 74-76° E longitude. There is a marked difference existing in the dominating features of the glaciers in the western section of Kunlun Shan (Muztagata Shan Kongur Shan), western section of the Karakoram (Hunza Karakoram and Saltoro Karakoram) and western section of the Himalayas (Mt. Nanga Parbat). Results obtained through research on glaciology indicate decidedly that the properties of glaciers and their active capability mainly depend on the level of mass balance and that morphologic features of glaciers depend on the topography of preglacial age and stages of development of glaciation.

On the basis of repeated measurements at a fixed station, geomorphological investigation and aeronautical observation and in light of the documentary records

[Continuation of DILI XUEBAO Vol 35 No 2, Jun 80 pp 149-160]

and recall of the local residents, we come to the conclusion that the termini along the Karakorum Highway have been subject to many fluctuations within comparatively recent times. From the 80's of the last century to the 20's or 30's of this century, the glaciers either advanced in general or were relatively stationary. From the 30's to the 60's, the glaciers retreated on a wide scale. Since the 60's, the changes in the positions of the glacier fronts have presented a very heterogeneous picture. Take the glaciers in the western section of the Karakoram Mountains, for instance. In this period a great number of them have been advancing, with some of the retreating.

In accordance with the amplitudes of glacial variations, the glaciers along the Karakorum Highway can be classified into two magnitudes. First, the amplitude of several meters or several decades of meters during some years or several decades of years. These include, for instance, the glaciers in Mt. Muztagata Shan and Mt. Kongur Shan, which are characteristic of the continental type glaciers. Second, the amplitude of some hundred meters during several years or decades of years. The valley glaciers in the western section of the Karakoram Mountains and Mt. Nanga Parbat belong to this category. They are normal glaciers with high level of mass balance and active motion.

In addition, the amplitude of several kilometers during some years or several



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Examples of surging, such as Hasanabad Glacier, Minapin Glacier and some others in the basin of the Hunza River, which are the cyclic fast advancing glaciers of the surging type.

The surging glaciers in the basin of the Hunza River have a periodicity by far longer than that of the same types of glaciers in other parts of the world (usually 20-30 years). The supraglacial topography of the surging glaciers in the basin of the Hunza River is short of the folded moraines, a phenomenon resulting from the loops and folds in medial moraines, with the exception of the highly crevassed and at times great transverse cracks.

We also discovered that the general tendency of the fluctuations of the glaciers along the Karakorum Highway seemed to bear a certain similarity to the fluctuations of the existing Alpine glaciers in Europe, with the exception that the time lags a little behind.

The common characteristics of the termini of the advancing glaciers along the Karakorum Highway are as follows: The ice cliffs at the snout are steep and giant with their gradients exceeding  $30^\circ$  and relative height over 80 meters. The front of the ice cliff has a push moraine formed as a result of the pushing

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of the advancing glaciers and there are a lot of rounded pebbles in the push moraines.

— GHI Yafeng [2452 7161 7364] and WANG Wenyong [3769 2429 7336], both of our institute, and LI Yindan [2021 5593 2849] of the Institute of Geology, Chinese Academy of Sciences, took part in the field work of the present study.

AUTHOR: GUO Xudong; [6754 2685 2649]  
SHENG Xuebing [9161 1331 2640]

ORG: CAO of the Institute of Geology, Chinese Academy of Sciences; SHENG of the Institute of Geology, State Seismological Bureau

TITLE: "Geochemical Characteristics of Weathering Crust on the Quaternary Basalt in Hainan Island, China"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 161-173

TEXT OF ENGLISH ABSTRACT: The lateritic weathering crust which developed on the basaltic tableland is widely distributed in the northern part of Hainan Island. According to the periods of basaltic eruption, three main weathering stages can be distinguished, i.e., the Shimaolin (Middle Pleistocene), Huguanguan (Late Pleistocene), and Leihulin (Holocene) stages. Of them, the red earth formed only in the Shimaolin.

In laterites can be found some clay minerals, such as gibbsite, halloysite, kaolinite, goethite, hematite and montmorillonite.

The chemical analysis of some samples from the weathering crust gives the average contents of  $\text{SiO}_2$ ,  $\text{Al}_2\text{O}_3$  and  $\text{Fe}_2\text{O}_3$  as the following:  $\text{SiO}_2$ --33-34%,  $\text{Al}_2\text{O}_3$ --

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25-27% and  $\text{Fe}_2\text{O}_3$ --22-23%. It is obvious that in the upper part of the weathering crust the content of silicon is decreasing, whereas the contents of iron and aluminum are increasing. The absolute migration amounts of chemical elements in laterites from Quaternary basalt are calculated for the Shimaolin stage as follows:  $\text{SiO}_2$ --about 40%, CaO and MgO--nearly 92.45% and 94.85%. For the Leihulin stage, the values of  $\text{SiO}_2$  and MgO are about 17.5% and 20.91% respectively. Since 10,000 years B.P. the leaching rate of  $\text{SiO}_2$  and CaO was estimated as  $3.9 \times 10^{-3}$  g/cm<sup>2</sup>/y. and  $1.5 \times 10^{-3}$  g/cm<sup>2</sup>/y. respectively. In general, the ratio of  $\text{SiO}_2/\text{Al}_2\text{O}_3$  and  $(\text{CaO} + \text{Na}_2\text{O} + \text{K}_2\text{O})/\text{Al}_2\text{O}_3$  varies from 1 to 2.5 and 0.015 to 0.06 for the Shimaolin stage, while the ratio of  $\text{SiO}_2/\text{Al}_2\text{O}_3$ ,  $\text{Fe}_2\text{O}_3/\text{Al}_2\text{O}_3$  and  $(\text{CaO} + \text{Na}_2\text{O} + \text{K}_2\text{O})/\text{Al}_2\text{O}_3$  can be obtained from some locations along the coast in Guangdong Province. From the calculated values, a tendency of increasing can be seen that is probably related to the reduction of oxidation caused by the decreasing of precipitation and temperature from northern Hainan Island to the coastal area in Guangdong Province.

Among the relative contents of three major oxides ( $\text{Al}_2\text{O}_3$ ,  $\text{SiO}_2$  and  $\text{Fe}_2\text{O}_3$ ) exists a positive correlation function for the early stage of chemical weathering, whereas for the middle stage it is a correlation function of equivalence or partial correlation. Finally, for the latest stage it appears to be a function of negative correlation.

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Based upon the physical and chemical properties of weathering crust, the authors put forward a new concept dealing with the extensive laterization in the course of the weathering process.

\* The following participated in the field work for the present study: YUAN Baoyin [5913 1405 0603], FENG Wenke [7458 2429 4430], ZHAO Xitao [6392 1585 3447], LI Yuanshan [2621 0337 1472], YU Xiangyu [4416 4382 5940], MIAO Xiangshan [4924 4382 1472] and XUE Wanjun [5641 8001 0193].

AUTHOR: LING Yuquan [5677 5940 3123]  
WU Zheng [0702 2973]

ORG: Both of the Wind Tunnel Laboratory, Lanzhou Institute of Desert Research, Chinese Academy of Sciences

TITLE: "Experimentation on the Dynamic Photography of the Movement of Sand-Driving Wind"

SOURCE: Beijing DILI XUEBAO [ACTA GEOGRAPHICA SINICA] in Chinese Vol 35 No 2, Jun 80 pp 174-181

TEXT OF ENGLISH ABSTRACT: The research on the physical process of single sand grains under the influence of wind force plays a rather important role in the research of the movement of sand-driving wind. Therefore, we used photography in the wind tunnel, especially that of high speed cinematograph (frequency 2000 frames/s). The preliminary experimental photographs on the saltation process of natural uniform quartz sand grains (of diameter 0.15 cm and density  $2.6 \text{ g/cm}^3$ ) show that the movement of sand-driving wind is a movement of quick change of rotation near the ground surface. Its rotational speed is  $10^2$ - $10^3 \text{ r/s}$ . The speed of the movement of sand grains is one order of magnitude less than that of wind velocity, its rate of speed variety reaching  $10^3$ - $10^4 \text{ cm/s}^2$ .

[Continuation of DILI XUEBAO Vol. 35 No. 2, Jun 80 pp 174-181]

\* Also taking part in the experimental work were: GAO Yongxiang [7559 2589 1685], LIU Xianwan [0491 633 8001], HE Daliang [6320 1129 5328] and CHEN Fusheng [7115 4395 4942]. High speed photography by: CHEN Liangyi [7115 5328 5135] and WANG Yongxiang [3769 3057 4382], both of the Xian Optical Institute, Chinese Academy of Sciences.

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0504 5109

AUTHORS: DU Hailin [2629 0583 0066]

ORG: Research Institute of Anshan Iron and Steel Company

TITLE: "Petrographic Observation on Hematite Pellets of East-Anshan Iron Ore Concentrate in Blast Furnace Smelting"

SOURCE: Beijing, JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 1-7

TEXT OF ENGLISH ABSTRACT: Samples of low basicity hematite pellets made from East-Anshan iron ore concentrate and charged in a 100 m<sup>3</sup> experimental blast furnace have been taken from five equalized points along the diameter of the furnace shaft at 6.5 m below the burden line during processing. A petrographic observation on mineralogical reactions of the samples has been made in comparison with the industrial fluxed sinters sampled in the same manner. It was shown that the indirect reducing reaction occurs under temperatures above that of the pellet firing in all samples. The reducing gases of the furnace atmosphere penetrate through the pores and gaps of the pellet and react with its liquid and solid phase substances. The behavior of the reducing reaction in the pellets appears to be better than that of sinters owing to their different

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micro-porous structures. Since the pellets flow downward along individual paths with various courses of reaction, six typical models of concentric layer structure would be proposed. The iron oxides matrix is bonded essentially by molten silicates of CaO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub> system formed at high temperatures and by other systems, e.g., CaO-FeO-SiO<sub>2</sub>, etc., as well. The magnetizing phenomenon of the CaO-Fe<sub>2</sub>O<sub>3</sub> system has also been observed.

AUTHOR: None

ORG: Joint Research Group of Beijing Institute of Iron and Steel Technology and Baotou Iron and Steel Company

TITLE: "An Improvement on Sinter Quality of Baotou Iron Ore Concentrate"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 8-17

TEXT OF ENGLISH ABSTRACT: A study was made of the macro- and microscopic structure and mineralogical constitution of sinter prepared by Baotou iron ore concentrate, which differs from others by the presence of remarkable quantities of fluorine and rare earth compounds. The viscosity and surface tension of sinter slag phase have been measured with various additions of  $\text{SiO}_2$  and  $\text{CaF}_2$  in the sinter. It was observed that the fluorine, mainly as  $\text{CaF}_2$ , forms itself into cuspidine which is a major constituent injurious to the properties of the bonding phase and consequently to the strength of the sinter. The fluorine-bearing mineral decreases obviously the viscosity and surface tension of the slag in the sinter and in turn makes the sinter porous with an open tubular thin framework structure. A certain amount of  $\text{SiO}_2$  may also lower the strength of sinter slag bonding, yet it seems to act secondarily. In order to improve the strength of Baotou sinter, decreasing its fluorine content to less than 1.5% in

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the concentrate by beneficiation may be preferable. Furthermore, both raising the slag basicity up to 2.0 and adding dolomite to substitute partially for the limestone in sinter burden materials may also be effective. An industrial process raising the sinter basicity up to 2.0 was found to be successful in trials in the Baotou Iron and Steel Company.

\* The article was written by: ZHOU Quding [0719 0648 1353], REN Yunfu [0117 0336 5446] and LI Fengyi [2621 7364 0308].



AUTHOR: LIU Fayou [0491 1481 2589]

ORG: Central Laboratory of Kunming Iron and Steel Company

TITLE: "The Growth and Cross-Connection of  $\text{Fe}_2\text{O}_3$  Platelets in Consolidation of Hematite Pellet"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 18-21

TEXT OF ENGLISH ABSTRACT: The strengthening process of hematite pellets made from iron ore concentrate of Kunming Iron and Steel Company has been examined by SEM, X-ray diffraction, etc., to ascertain the strengthening mechanism when they were fired under temperatures between 1000 and 1350°C. The hematite crystallites began to grow into trigonal platelets and to cross-connect each other at temperatures up to 1000°C. Up to 1200°C, the cross-connection was further strengthened into a solid framework. Therefore, it seems to be easily clarified why a rather firm strength of pellets is displayed earlier under lower firing temperatures. Perhaps neither molten slag formed over the surface of hematite crystals with vein and impurities nor a little magnetite crystallized out of melt will play a dominant role in the strengthening process of these hematite pellets.

AUTHOR: WANG Yunshi [3769 0336 1395]  
HOU Cuiqing [0186 5050 5493]  
WANG Mingxian [3769 2494 6343]

ORG: All of the Institute of Metal Research, Chinese Academy of Sciences

TITLE: "An Investigation of Freckles in an Iron-Nickel Base Wrought Superalloy"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 22-29

TEXT OF ENGLISH ABSTRACT: An investigation of freckles observed in Fe-15Ni-15Cr-2.5Al-2.5Ti-2W-2Mo wrought superalloy has been carried out. The freckles were actually dendrites which may appear as small spots or streaks depending on whether cross- or longitudinal sections of the bar are taken. Enrichment of Ti, Al, Si, Mo, Ni and minute C, B, S, etc., in interdendritic spaces in the freckles' region may result in the formation of  $\gamma'$ ,  $\text{Ti}(\text{C}, \text{N})$  and  $\text{M}_2\text{B}_2$  as well as in the growth of the  $\sigma$ -phase which was observed only in the freckle areas. In the case of the freckles' region, the temperature of fusion would be low, probably being about 1190°C which is nearly 40°C below that of the matrix. If the hot working of the alloy is carried out at about 1190°C, microcracks may be formed in these freckles' region. The freckles can not be eliminated completely, even after soaking for a long time at elevated temperatures. The

higher hardness associated with the freckles can be troublesome in machining and in giving a rough machined surface. In view of the fact that the  $\gamma'$ , the brittle intermetallic  $\sigma$ -phase and the non-metallic inclusions are somewhat locally concentrated, the mechanical properties of such an alloy might be expected to be adversely affected.

The freckle segregation is essentially associated with gravity segregation. It is caused by the upward movement of jets of liquid metals enriched with light elements in the mushy zone during solidification. The tendency of forming freckles seems to be related to the melting rate of the consumable electrode as well as to the depth of the liquid metallic pool.

AUTHOR: GUO Hanting [6753 1696 0080]

ORG: Institute of Metal Research, Chinese Academy of Sciences

TITLE: "Effect of Carbon and Boron on Mechanical Properties and Microstructure of an Iron Base Superalloy"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 10-17

TEXT OF ENGLISH ABSTRACT: The effect of carbon and boron on the stress rupture properties at 600 and 750°C as well as on the tensile properties at room temperature and 650°C of a FeNiCo type iron base alloy has been investigated. Both carbon and boron seemed to be markedly influential in the stress rupture life of the alloy, which reached its peak value with 0.03 - 0.05% C and about 0.006% B. However, the notched-rupture sensitivity was hardly affected. The increment of boron content may cause lowering the eutectic temperature of the boron- $\gamma$  phase. The amount of boride eutectic increases with the increase of boron content and the solution treatment temperature. Minute boron- $\gamma$  phase eutectic affected the room temperature tensile properties less, but markedly shortened the rupture life.

\* Also taking part: ZHANG Jinyan [1728 6855 1585] and FAN Heming [5400 7729 7686].

AUTHOR: LAO Yang [5012 7122]  
ZHANG Baicheng [1728 4102 2052]  
ZHOU Xiuyuan [0719 4423 1254]  
MA Hongliang [7456 7703 5328]

ORG: None

TITLE: "The Effect of Decarburizing Process on the Magnetic Properties of the Grain Oriented 3% Si-Fe"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 38-52

TEXT OF ENGLISH ABSTRACT: The effect of the decarburizing process on the magnetic properties of the grain oriented 3% Si-Fe has been studied. An empirical expression for the rate of decarburization under given conditions was proposed. While the time of decarburization was given, the carbon content in 3% Si-Fe might be predicted, and vice versa. Another empirical expression for the rate of grain growth was also derived from observation of normal grain growth during decarburization.

Based upon the aforementioned expressions, the functional dependence of the carbon content before secondary recrystallization and time required for

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decarburization on final magnetic properties of the grain oriented 3% Si-Fe has been discussed. A two-dimensional plot was then drawn on which the decarburizing process would be easily determined to acquire materials of superior quality.

\* ZHAO Xizhen [6392 6932 3791] of the Wugang Steel Institute also participated in some of the experimental work.

AUTHOR: YU Xuejie [0205 1341 4646]

ORG: Shanghai Institute of Iron and Steel Research

TITLE: "A TEM Observation of the Secondary Hardening Process in a 6Cr4Mo3Ni2WV Die Steel"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 53-58

TEXT OF ENGLISH ABSTRACT: The microstructure changes in the tempering process of a quenched 6Cr4Mo3Ni2WV Matrix steel have been studied by TEM. Special attention has been paid to the observation of the microstructures near the peak of the hardness-tempering temperature curve. It is shown that the secondary hardening of the steel is mainly brought about by the precipitation of  $V_4C_3$  and  $M_2C$ . With the tempering temperature below 450°C or so, the cementite lathes precipitated at the twin boundaries and {112} planes are fairly stable. However, they are transformed into a metastable phase, and finally are replaced by  $V_4C_3$ ,  $M_2C$  and a new fine cementite when the tempering temperature is raised to beyond 500°C. This process certainly leads to an increase in strength (secondary hardening), and what is more, it leads to a substantial improvement in impact toughness in the meantime. The best impact toughness is obtained by the time the cementite lathes are completely transformed. When tempering in

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the range of 600-650°C, the  $V_4C_3$ ,  $M_2C$  and also the fine cementite coalesced to equiaxed particles  $M_6C$  or  $Cr_7C_3$  at the austenitic grain and sub-grain boundaries, and the impact toughness of the steel drops accordingly.

AUTHOR: SUN Fuyu [1327 4395 3768]

ORG: Central Iron and Steel Research Institute, Ministry of Metallurgical Industry

TITLE: "Correlation between the Characteristic Length Parameter of the Quasi-Cleavage Fracture and Fracture Toughness"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 59-64

TEXT OF ENGLISH ABSTRACT: The fracture surfaces of certain fracture toughness specimens have been examined by SEM. With materials fractured in quasi-cleavage mechanism, the mean distance  $\bar{\xi}$  from the pre-crack tip to the site where the quasi-cleavage crack starts is regarded to be a characteristic parameter. It seems that this is related to  $G_{IC}$  and can be used as an important parameter characterizing the stress field of the plastic zone.

AUTHOR: LU Mangi [0712 2581 3825]  
QI Zhenzhong [2058 7201 0022]  
WU Pinggen [0702 1627 2773]

ORG: All of the Institute of Metal Research, Chinese Academy of Sciences

TITLE: "A Study of the Kinetics of Hydrogen Absorption in  $\text{LaNi}_5$ "

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 65-72

TEXT OF ENGLISH ABSTRACT: The kinetics of hydrogen absorption in  $\text{LaNi}_5$  have been investigated at initial pressures of 15-30 atm and temperatures in the range of 20-85°C.  $\text{LaNi}_5$  was prepared in a  $\text{ZrO}_2$  crucible in a graphite-tube furnace under a vacuum. It is shown that a linear relationship exists between the amount of hydrogen absorbed,  $W$ , and the time of reaction on a logarithmic scale and the rate of hydrogen absorption depends on the initial pressure and the test temperature.

The P-X-T curves of the  $\text{LaNi}_5$  system have been determined. For each test temperature there is a corresponding pressure plateau  $P_0$ , and it is therefore assumed that for every initial pressure  $P_0$  there is a corresponding balance temperature  $T_0$ , and  $T_0 - T$  may be taken as the driving force of the hydrogen

absorption process in  $\text{LaNi}_5$  at initial pressure  $P_0$  and test temperature  $T$ . The absorption of hydrogen takes place in three steps: (1) surface reaction, which seems to be rather complicated; (2) diffusion of hydrogen atoms and (3) phase transformation from  $\text{LaNi}_5$  to a hydride phase. All these steps are thermal activation processes, and therefore the  $e^{-U/RT}$  can be introduced in the hydrogen absorption process. The relationship between the absorption rate, the initial pressure, the test temperature and time is given as follows:

$$dW/dt = A_0(T_0 - T)e^{-U/RT} \cdot 1/t.$$

The activation energy of the rate limiting step  $U$  is about 2 or 3.2 kcal/mol according to whether the amount of hydrogen absorbed is less or more than 70% respectively. The parameter  $U$  of the rate-limiting step during hydrogen absorption in  $\text{LaNi}_5$  can be obtained as shown by our experiments.

\* Also taking part were: LI Xianwen [2621 2009 2429] and LI Guifen [2621 2710 5358].

AUTHOR: XU Shunsheng [6079 7311 3932]  
SU Qianwu [5685 0578 2976]

ORG: Both of Shanghai Institute of Metallurgy, Chinese Academy of Sciences

TITLE: "An X-ray Investigation of Age-Hardening Process of a Mg-5wt%Zn Alloy"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 73-82

TEXT OF ENGLISH ABSTRACT: The age-hardening processes of a Mg-5wt%Zn alloy have been studied by means of hardness measurement and X-ray diffraction analysis. On aging of this alloy at  $165^\circ\text{C}$ , two hardness peaks with corresponding structural changes in the alloy were noticed. X-ray investigation of this alloy in quenched state revealed that plate-like zinc clusters parallel to  $(0001)$  and  $\{10\bar{1}0\}$  planes of the magnesium matrix were formed. At the initial stage of  $165^\circ\text{C}$  aging, two- and three-dimensional metastable transition phase  $\beta_1'$  particles and one-dimensional transition phase  $\beta_2'$  rods were precipitated out from the super-saturated solid solution.  $\beta_1'$  existed only for very short periods, while  $\beta_2'$  still grew after aging for a total period of 100 h, when an equilibrium phase  $\beta$  began to precipitate out. During aging at  $190^\circ\text{C}$ , only one hardness peak appeared, corresponding to the concurrent precipitation of  $\beta_2'$  and  $\beta$  phases. The



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structural parameters of  $\beta_1'$  and  $\beta_2'$  and their orientational relationships with the matrix have been determined.

The thermal stability of  $\beta_1'$  was found to be rather high at 250°C, implying the probable applicability of the aged Mg-Zn alloys at higher temperatures.

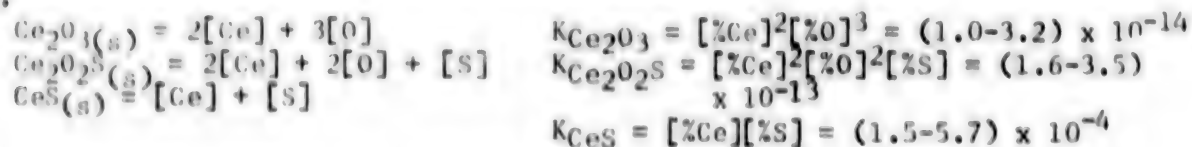
AUTHOR: WANG Changzhen [3769 1603 3791]  
WANG Fuzhen [3769 4395 3791]  
DU Yingmin [2629 5391 2404]  
ZHANG Xiaoping [1728 1420 1627]

ORG: All of Northeastern Institute of Technology

TITLE: "A Study of the Equilibrium of Ce-S-O in Molten Iron"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 83-90

TEXT OF ENGLISH ABSTRACT: Deoxidation and desulfurization equilibria between cerium, sulfur and oxygen in molten iron at 1600°C have been determined and studied thermodynamically. The apparent solubility products of these reactions are:



The interaction coefficients concerned are:

$$K_{\text{Ce}_2\text{O}_2\text{S}} = a_{\text{Ce}}^2 a_{\text{O}}^2 a_{\text{S}} = 3.9 \times 10^{-14}$$

$$k_{\text{CeS}} = a_{\text{Ce}} a_{\text{S}} = 1.9 \times 10^{-5}.$$

The standard free energy change for reaction  $\text{Ce(l)} = [\% \text{Ce}]$  has been found to be  $\Delta G_{\text{Ce}}^0 = -24,000 \text{ cal (100.4 kJ)}$  from which  $\gamma_{\text{Ce}}^0 = 0.397$  is obtained. The self-interaction coefficient of Ce is calculated to be  $e_{\text{Ce}}^{\text{Ce}} = 1.9$  and  $e_{\text{Ce}}^{\text{S}} = 0.0032$ . Combining these results with those from the literature, the change of standard free energy for reaction  $2\text{Ce(l)} + 1/2\text{S}_2 + \text{O}_2 = \text{Ce}_2\text{O}_2\text{S(s)}$  is  $\Delta G_{\text{Ce}_2\text{O}_2\text{S}}^0 = -241,000 \text{ cal (1008.3 kJ)}$ .

AUTHOR: LIU Shuyi [0491 0647 0308]

ORG: University of Science and Technology of China

TITLE: "Invariant Representation of Thermodynamics and Geometric Structure of Space of Reversible States"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 1980 pp 91-103

TEXT OF ENGLISH ABSTRACT: A geometric invariant representation of thermodynamics in space  $\Omega$ ,  $\Omega = \omega^f$  states;  $f$ --degree of freedom, of reversible states is given in this paper. A reversible state is one attainable from  $\omega^{f-1}$  directions  $(-dr) \parallel (-\Delta r)$  in  $\Omega$ . A state function  $\phi$  is distributed according to this law:

$$\frac{\omega^f \text{ states}}{\omega^f \phi \text{ values}} = (\omega^{f-1} \text{ states})_{\phi=C} = (\text{HC } \phi)$$

giving  $(\text{HC } \phi)$ --hyper-contour of  $\phi$  as the surface element in the geometric structure of  $\Omega$ . The invariant differential equation,  $\nabla \phi \cdot dr = d\phi$ , of  $\phi$  ( $\nabla \phi$ --gradient;  $dr$ --reversible process vector) yields the gradient line  $l$  (arc length) of  $\phi = \phi(l)$ . This, together with  $(\text{HC } \phi \text{ family})$ -structure of  $\Omega$ , leads to two extensions:

Extension in Distribution:  $\phi$  exists in whatever space its family compactly fills:





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The theory or structure of  $\Omega$  provides an effective guide for investigating phase equilibria. For example:

- (1) The meaning of gradient processes such as  $\nabla Z$ .
- (2) According to the concept of  $\Omega$ -structure, the plane phase diagrams are all coordinate planes without function (2), like maps without contour, although some work had been done.

An important result is the Principle of Block-fitting Addition for 1-dimensional phase diagrams,  $\Omega_1$ :

$$\Omega_1 = \left\{ \begin{matrix} \text{phase} \\ \text{region} \end{matrix} \right\} \frac{n_i}{d_i} \quad (\text{1-dimensional block-fitting addition}) \quad (V)$$

$n_i$  = no. of dimensions of  $i$ -th phase region;

$d_i$  = no. of independent chemical constituents;

which states that  $\Omega_1$  is made of many phase regions ( $i=1,2,\dots$ ) fitted together with each region as a "block." In this sense, (V) is expansible in blocks, for example,

$$\Omega_{1P} = \left\{ \begin{matrix} \text{phase} \\ \text{region} \end{matrix} \right\} \frac{n_i}{d_i} = \{[A] + [B]\}_{21}^2 + \{[A] + L + [B]\}_{22}^0 + \{[A] + L\}_{23}^2 + \{L\}_{24}^2 + \{L + [B]\}_{25}^2 \quad (V-4)$$

for a binary eutectic system under constant pressure. So the  $\Omega$  for a thermodynamic equilibrium exists for

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$$\Omega_{\text{exists}} = \left\{ \begin{matrix} \text{phase} \\ \text{region} \end{matrix} \right\} \frac{n_i}{1000} \quad (\text{1-dimensional block-fitting addition}) \quad (V-6)$$

$$V = 1000^\circ \text{C} \cdot \text{mol}^{-1}$$

In conclusion, it seems that this geometric implicit treatment may provide a simple, clear and rational mathematical framework for thermodynamics of reversible chemical reactions. The author hopes that it will help in research and application in thermodynamics.

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AUTHOR: LIAN Fenlan [5663 5358 5695]  
LIAO Qianchu [1675 0051 0443]

ORG: Both of Steel and Iron Research Academy, Ministry of Metallurgical Industry

TITLE: "A Rapid Method for Indexing the Electron Channelling Pattern"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 80 pp 104-108

ABSTRACT: With scanning electron microscope, the figure obtained from the specimen with high energy electronic electron channelling effect is called electron channelling pattern, which may be used to proceed with many types of studies of the crystal, including its structure and characteristic. Before the pattern may be used as a foundation for analysis, crystallographic indexing is necessary. At present, the major indexing methods are the comparative method and the analytic method. Both methods require considerable preparation and are time consuming. This paper introduces a new method of indexing developed by the authors on a theoretical basis of combining both comparative and analytic methods. Based upon the electron channelling pattern that has already been indexed, a table is made listing the relationship between the Miller indices of any two cross-electron channelling bands and the corresponding  $K \cdot \theta$  values. The process of making some simple measurements and calculation to find the crystal plane index of corresponding electron channelling band by checking the table is explained.

This paper was received for publication on 30 Apr 79.

AUTHOR: LONG Qiwei [7893 2601 1218]

ORG: Institute of Metals, Chinese Academy of Sciences

TITLE: "The Migration of Impurity Atoms and Hydrogen Embrittlement Cracking"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 80 pp 109-111

ABSTRACT: It is generally believed that hydrogen embrittlement cracking is a process related to diffusion of hydrogen atoms. When the local density reaches a critical value, crack will begin, and in each step, the crack can leap a given distance only. When cracking extends to a region of very low hydrogen content, it will temporarily stop. Then, hydrogen atoms are further diffused and concentrated, and the cracking process will resume. This paper analyses this process of forward extension of discontinuous cracking, and suggests concrete experiment for verification.

This paper was received for publication on 3 May 79.



AUTHOR: QIAO Guichen [0829 2710 2429]  
SHANG Yuhua [1424 3768 5478]  
CAO Mingren [2559 2494 0088]  
GUO Qingfeng [6751 1987 0025]

ORG: QIAO, SHANG of Institute of Metals, Chinese Academy of Sciences;  
CAO, GUO of Qiqihar Steel Mill

TITLE: "On Spots of 37CrNiMo Steel"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16  
No 1, 30 pp 112-114

ABSTRACT: When alkaline open-hearth furnace (parent material)-electric slag remelting process is adopted for 37CrNiMo steel, the comprehensive property index of the material is greatly improved. Upon inspection, some black colored spots appear easily, however, while the grade remains relatively high. An experiment is carried out to study the nature of this type of spots and their effect on the property of the materials and several tests are performed. Results indicate that these spots are a form of liquation type defect. When the material is washed in acid, separation of components causes a corrosion phenomenon, mainly liquation of C, S, P, and alloy elements of Mo, Cr, Si, Mn, and Ni. At the same time, in the liquation region, there are often fine strips of MnS mixture. The spots do not have obvious effect on regular mechanical property, but malleability is somewhat reduced. This paper was received for publication on 27 Mar 79.

AUTHOR: JI Jingwen [2061 2549 2429]  
XIAO Lianfang [5135 6647 5364]  
CAO Huanan [2559 2037 5549]

ORG: All of Baotou Institute of Metallurgy

TITLE: "The Effect of Rare Earth Mischmetal on the Temper Brittleness of Two Low Alloy Steels Containing Manganese and Phosphorus"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16  
No 1, 30 pp 115-117

ABSTRACT: Reversible temper brittleness characterized by crystal boundary crack is one of the major problems of structural steel. This paper studies the action of rare earth in two types of low alloy high phosphorus steel with regard to its temper brittleness. The results demonstrate that rare earth can suppress temper brittleness of austenite boundary of steel and is effective element for improving reversible temper brittleness resistance of structural steel. This paper was received for publication on 12 Jul 79.

AUTHOR: (1) WANG Zhechang [3769 5074 2490]  
(2) None

ORG: (1) Institute of Metals, Chinese Academy of Sciences; (2) None

TITLE: "Discussion on 'An Investigation of Has Microcracks in Multilayer Welding of Low-Alloy High-Strength Steels'"

SOURCE: Beijing JINSHU XUEBAO [ACTA METALLURGICA SINICA] in Chinese Vol 16 No 1, 80 pp 118-119

ABSTRACT: This paper contains (1) a letter by WANG Zhechang, expressing his opinions as well as some questions concerning the contents of a paper "An Investigation of Has Microcracks in Multilayer Welding of Low-alloy High-strength Steels" which was published in Vol 14 No 4, 78 issue of the Journal (pp 383-396.) and (2) a reply by the original author, whose name does not appear in this paper.

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